products finishing

DECEMBER
1958

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finishes on metal products

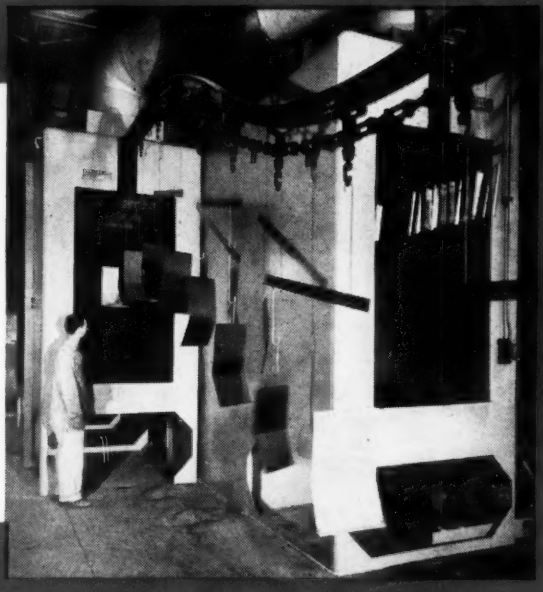
Cincinnati CLEANING AND FINISHING SYSTEM

installed by

BRUNING

produces

- Savings in Material Handling
- Improved Product Quality
- Better Working Conditions



Cincinnati Cleaning & Finishing Machinery is used in the production of a wide range of Bruning equipment for drafting and copying, earning the user's commendation for savings, improved product and working conditions.

The monorail cleaning machine shown here processes frame parts and cabinets of copying machines prior to finishing; it is also used to clean machined parts between operations. The cleaning machine is part of a complete Cincinnati system which also includes: dry-off oven, down-draft spray booth, paint bake oven, monorail conveyor and air make-up unit.

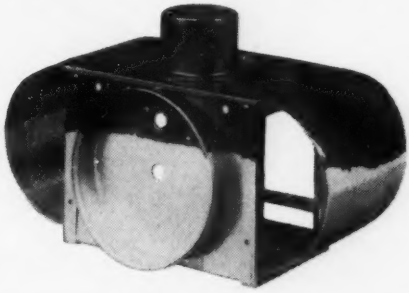
Use the engineering and experimental facilities of Cincinnati Cleaning to get more economical cleaning and finishing . . . with better results . . . in your plant. For details, write:

Cincinnati Cleaning & Finishing Machinery Co., 2008 Hageman St., Cincinnati 41, Ohio.

For more data circle 301 on Postpaid Card

What happened to this "unstrippable" coating?

This steel housing for an outdoor lamp is finished with a weather-resistant "unstrippable" coating ... or so it seemed. Immersion in Oakite Stripper S-A, cold, took the coating right off. (In photo, housing was dipped only part way for demonstration purposes. In actual stripping operations, complete immersion is recommended.)



It was dipped in Oakite Stripper S-A!

If you've been discarding rejects as too difficult or too expensive to strip, you can now salvage them with the help of Oakite Stripper S-A. This new acidic solvent, which automatically maintains its own pH through a long life of stripping action, quickly removes the toughest coatings, such as:

epoxy resins **acrylics**
vinyls **polyesters**
hard-to-strip paints, enamels, lacquers

For more information about this remarkable new stripper, write for bulletin F–10447 to Oakite Products, Inc., 20 Rector Street, New York 6, N. Y.

in our 50th year

SPECIALIZED INDUSTRIAL CLEANING
OAKITE®
MATERIALS · METHODS · SERVICE
SCIENCE

Export Division Cable Address: Oakite

Technical Service Representatives in Principal Cities of U. S. and Canada

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Wheels coated with ALUNDUM abrasive give a high polish faster, for less money. In setting up the wheels, the high capillarity of this polishing grain improves and speeds up the wetting process with glue or cement.

Set your polishing wheels up to save!

ALUNDUM abrasive brings you the value-adding, cost-cutting "Touch of Gold"*

Norton abrasives are first choice in many plants for the widest range of polishing jobs. Where especially long life is desired the blocky shaped E_1 ALUNDUM B abrasive is extremely popular. Available in grit sizes 14 to 240. Where faster cutting action is required E_{138} ALUNDUM R abrasive (sizes 100 to 240) is first choice. Both types are specially treated to give much greater adhesion with glue or cement.

Typical advantages common to all ALUNDUM polishing grains include:

- *Uniform grain shapes*, assuring fast, uniform cutting action.
- *Uniform grain sizings*, with no oversize grains to mar the finish, no undersize grains to loaf on the job.
- *High capillarity*, assuring the easy absorption of adhesive that means longer lasting, better performing set-up wheels.

The booklet "Setting Up Metal Polishing Wheels and Belts" contains valuable facts on the various types of ALUNDUM abrasive, and on the best means of preparing wheels. Ask your Norton Distributor for it. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON
ABRASIVES

G-355

Making better products . . . to make your products better

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BEHR-MANNING DIVISION Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

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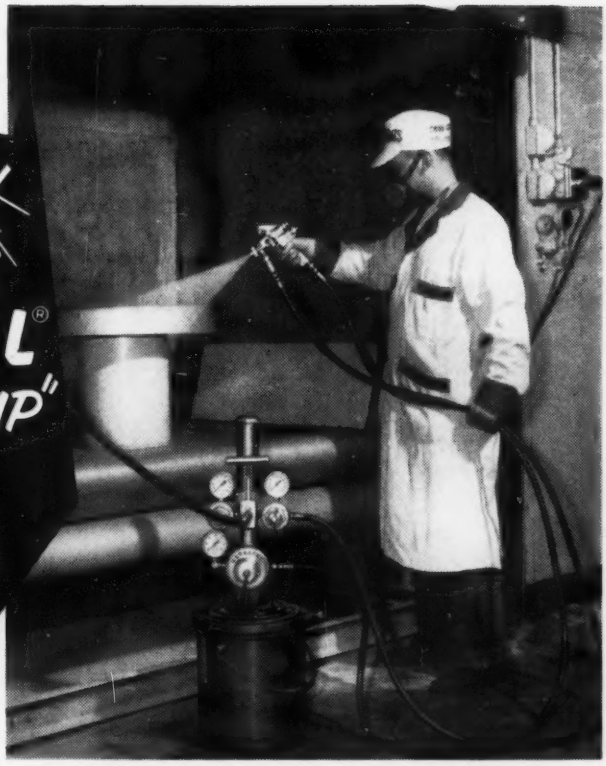
for low-cost maintenance and production painting



Fits directly on original 5-gallon containers! **Air-powered pump operates at "2 to 1" ratio—delivers 2 lbs. of pressure at the spray gun for every 1 lb. of air pressure applied to pump. Provides ample material supply through long hose lines. Automatic, constant agitation.**

- Ideal for production operations and maintenance painting . . . in plants, shipyards and transportation shops!
- Handles a wide range of protective and finishing materials—lacquers, enamels, primers, sealers, vinyls, epoxys, urethanes, spray booth and strippable coatings!
- Easy portability . . . lightweight . . . compact design. No dollies required to move unit—even with a full container!
- No disassembly required for cleaning. Flushes clean quickly by operating pump in solvent. Faster color change-over—in minimum time, with minimum effort!

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DIVISION
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Get the extras that cut costs and guarantee consistent results... Competitiv
tested materials, comprehensively and conscientiously serviced by a nationwide network of s
engineers and distributors. Federated's materials include new ASARCO-CAST COPPER anode, triple-
Conducta-Core lead anode, copper, zinc, tin, tin-lead, cadmium, brass and silver anodes. Nickel sa
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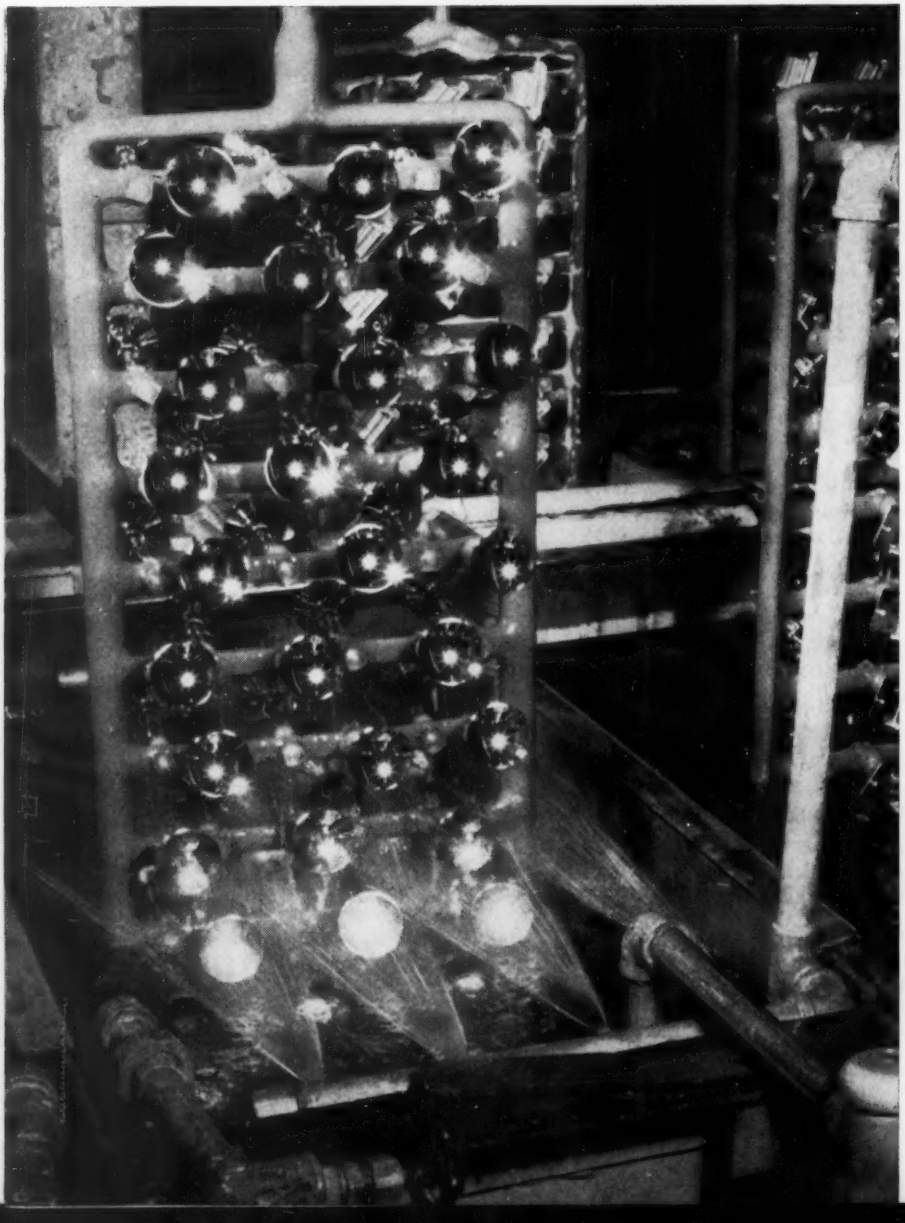

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products finishing

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Member
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Metal Finishing Suppliers Association, Inc.

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Published monthly with two issues in March and copyrighted (1958) by Gardner Publications, Inc., 431 Main St., Cincinnati, Ohio. Printed in U.S.A. Accepted as controlled circulation publication at Cincinnati, Ohio.

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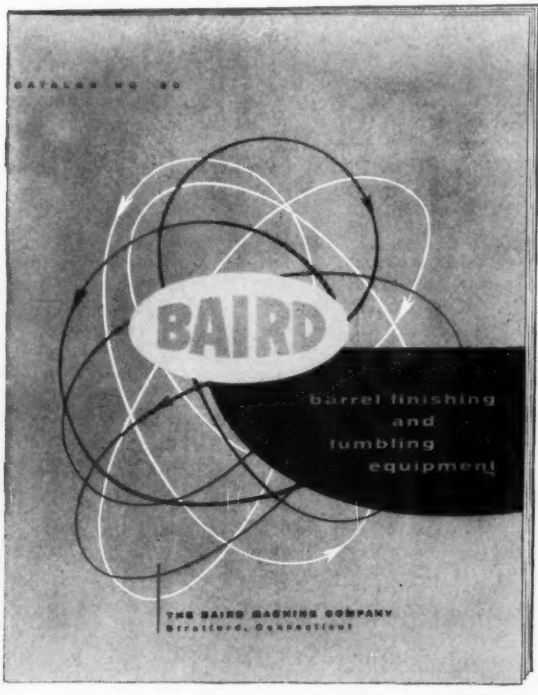

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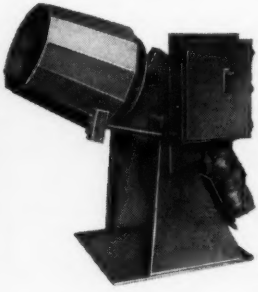

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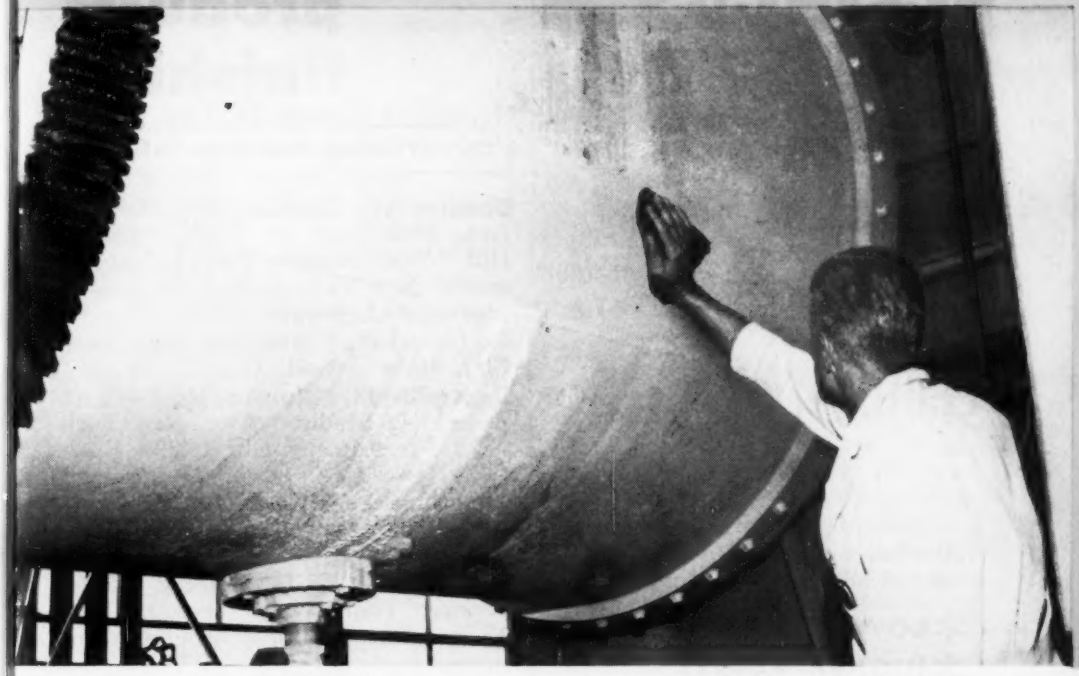

At The Glidden Company, paint drippings from a pebble and steel ball mill are easily cleaned off the Epon resin-based exterior surface coating with a solvent-dipped rag.

Chemical-resistant Epon® resin-based coatings guard paint production equipment from corrosion ...greatly reduce maintenance costs

At one of the paint production plants of The Glidden Company, enamel coatings on equipment were often stripped down to bare metal in only 30 days by the corrosive action of caustic cleaners. Maintenance costs were high.

To reduce costs for general housekeeping and repainting, the grinding mills, storage tanks, structural steel, and concrete areas were coated with Glidden's own Epon resin-based paint, Nu-Pon Cote.

Even though the Epon resin-based coatings are constantly exposed to hot caustic soda solutions, solvents, paint splashes, and abrasion, a fast washing down with solutions of petroleum and ester solvents keeps them clean and bright. Equipment is completely free from corrosion. *The Epon resin-based coatings have already lasted 4 times longer than the previous enamels.*

If you have a paint maintenance problem . . . where ordinary paints just can't take it—ask your plant supplier for Epon resin-based paint. You'll find that it is unsurpassed as an all-purpose industrial coating.

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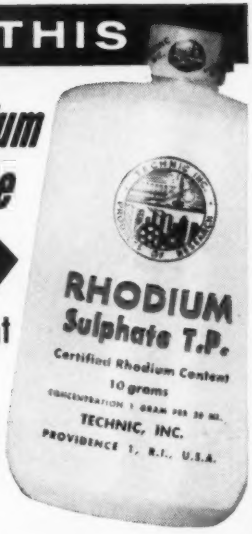

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★ ★ ★

Circulation over 21,500— largest in the finishing field

(Adv.)

First of two articles on

Chemical Prepaint Treatments for Metal Surfaces

By J. H. GEYER
Manager, Product Development Dept., AMCHEM PRODUCTS, INC.

Chemical prepaint treatments are designed to do four jobs well. First, they remove organic soils, shop dirt, scale, and rust or corrosion products from the metal surface. Second, they provide surfaces that are completely compatible with subsequent paint films. Third, they produce a *tooth* that promotes good paint film adhesion. Fourth, they effectively prevent underpaint corrosion growth after any breakthrough in the paint film.

Basically, there are four types of chemical prepaint treatments. These are phosphoric acid, iron phosphate, zinc phosphate, and amorphous phosphate or chromate. Two are discussed briefly in the following paragraphs.

Iron Phosphate

Iron phosphating processes are extensively used in the chemical prepaint treatment of appliances such as water heater shells, ranges, washers, dryers and other *white lines*. These processes will produce excellent paint-bonding films on the metal and retard or prevent underpaint corrosion. Duridine,® ACP's iron phosphating process, is a combination organic soil cleaner and iron phosphate coating material. Both the cleaning and coating operations take place in the same bath. Iron phosphates do not lend themselves to brush-on application, are primarily designed for spray type equipment of four or five stages. However, several dip installations are operating today by inclusion of an alkali precleaning stage.

Zinc Phosphate

ACP Granodine® is an example of this type of chemical prepaint treatment process, the type now being used to treat steel in the automotive industry, and predominantly specified for steel ordnance and military items. This process forms a coating which offers the ultimate in paint adhesion promotion and vastly augments the corrosion resistance of subsequent paint films. Zinc phosphate materials are extremely flexible as to method of application—can be applied by brush, dip or automatic spray equipment. In a typical dip or power spray system, the stages would be alkali clean, water rinse, zinc phosphate treatment, water rinse, and acidulated final rinse. With considerable areas of rust or scale, an acid pickle should follow the alkali cleaning stage.

On zinc surfaces, the zinc phosphates perform a rather unique function. They act as a barrier against chemical reaction between the applied paint film and the zinc surface, preventing blistering and early breakdown of the film.

Two of the four major chemical prepaint treatments for metals have been covered briefly in this article. More complete information can be had by contacting an ACP sales representative or by writing us at Ambler, Pa.

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Ambler 14, Pa.

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A ready to spray clear lacquer, (Alkyd fortified) Daconite 5600 is recommended for use over blond stains, light fillers, light natural woods, Masonite and metal.

Daconite 5600 has excellent cold check resistance and produces a finish of exceptional paleness and color retention quality that will not ring from alcohol, water or hot dishes. It is highly resistant to scuffing and scratching.

5600 has been fully tested under actual market conditions. It has all the time and money saving features that assures you of production line economy as well as superior finished results.

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Featuring

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VAPOR and LIQUID - TIGHT VENTING ASSEMBLY ON ALL QUARTZ HEATERS

and

NEO-TITE†

VAPOR and LIQUID TIGHT ASSEMBLY ON ALL METAL HEATERS

THERM-X-RED, a superior line of immersion heaters, presented by **N.J. THERMEX**, introduces a new innovation of vapor venting to eliminate internal explosion in Quartz heaters. The **VAPO-VENT** assembly provides a venting system for expanding gases, a completely liquid sealed head assembly and an extremely versatile unit which permits field repair with standard replacement. These exclusive **THERM-X-RED** features are further aided by the **NEO-TITE** vapor and liquid tight assembly which protects the heating elements in both Quartz and Steel units. Here at last, is a thoroughly versatile unit permitting even accidental total immersion in highly corrosive chemicals with no harm to the equipment.

These and many more features are fully detailed in our latest catalog available on request. Models in standard, thermostatic and remote control thermostatic units are available in Steel, Stainless Steel and Quartz construction.

*ON QUARTZ HEATERS

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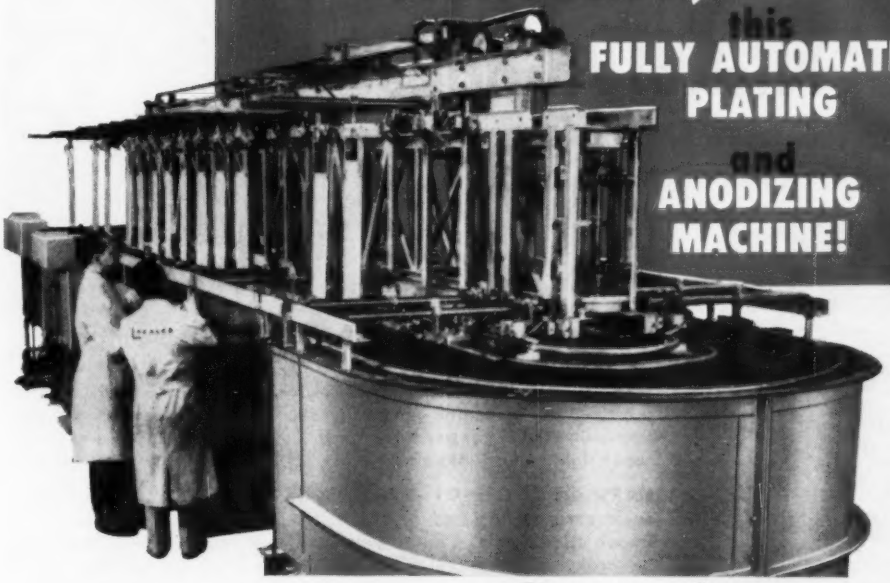

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- Because no elevating mechanism operates above rack carrier unusually low headroom is needed.
- Self-cleaning heavy duty contacts have positive 6-point connection . . . practically no attention is required.
- Tank surfaces are left clear by easily removable rack carriers . . . an advantage in servicing and in manual plating of large pieces.
- Automatic loading and unloading of parts from standard double-spine racks is available.
- Where conversion coatings and bright dips are used, a delayed set-down arrangement can be furnished to work automatically with the cycle.
- Where more than one cycle is required, machine can be made to include by-passing.

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Nickel Anodes
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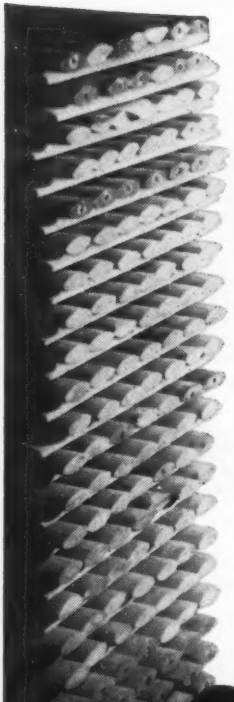

HARSHAW XXX CAST CARBON NICKEL ANODES are oval 1½″ x 3″ in cross section and are available in any length desired. Weight is approximately 1.1 lbs. per linear inch. They are normally used in dull, semi bright and bright nickel plating baths where the pH is 4.5 or lower.

HARSHAW ROLLED OVAL CARBONIZED NICKEL ANODES are 1¼″ x 3″ in cross section and are available in any length desired. Weight is approximately 1 lb. per linear inch. They are generally used in dull, semi bright and bright nickel plating baths where the pH is 4.5 or lower.

HARSHAW ROLLED OVAL DEPOLARIZED NICKEL ANODES have the same cross section and weight as the rolled oval carbonized nickel anode and are also available in any length desired. These anodes are generally used in nickel plating baths where the pH is 4.0 or higher; they are extremely suitable for such use, as they will corrode well over a wide range of operating conditions.

PACKAGES—Harshaw anodes are wrapped in a fibre reinforced laminated (without asphalt) paper. They are protected from tramp oils, dirt and grease and remain clean until used. The possibility of such contaminents being introduced into the plating solution from anodes is thus kept to a minimum.

Harshaw anodes are shipped in compact packages which feature built-in skids and facilitate quick handling by mechanical or hand trucks. The packages stack easily and quickly. Also, no deposits or returnables are involved with this type of packaging.

Harshaw Nickel Anodes are readily available and prompt shipment of any quantity will be made upon receipt of your order.

HARSHAW

Recasting Service

Our foundry facilities are available for recasting nickel anode scrap. Contact your nearest Harshaw Branch for further details.

THE HARSHAW CHEMICAL COMPANY

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PITTSBURGH, PENNSYLVANIA

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Is rust on precision parts a problem in your plating department?

FERLON REMOVES RUST WITHOUT HARMING METAL!

Wyandotte Representative Wm. Heinecke (left), and C. D. Roberts, Chief Chemist at A. O. Smith Corporation's Pacific Coast Works at Los Angeles, examine rust-free iron castings. A. O. Smith uses Wyandotte FERLON in soak tank — also adds it to the electrocleaner to enhance smut removal, improve detergency, prolong cleaner life.

THAT'S RIGHT! When damaging rust goes to work on steel parts, you can save time and replacement costs by using Wyandotte FERLON, alkaline derusting compound. That's because FERLON, unlike acids, removes rust quickly WITHOUT INJURY TO SOUND METAL —makes it ideal for use on expensive, close-tolerance machined parts!

For example, at A. O. Smith Corporation's Pacific Coast Works, a simple immersion in FERLON effectively removes heavy rust from large machined cast-iron parts. In addition, FERLON in the electrocleaner has resulted in much cleaner, smut-free castings. Cadmium plating is much brighter and of a higher quality.

Improve *your* plating by using FERLON for rust and smut removal. Call in your Wyandotte man, today, for a demonstration. Or write direct for complete details. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.*

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The Best in Chemical Products for Metal Finishing

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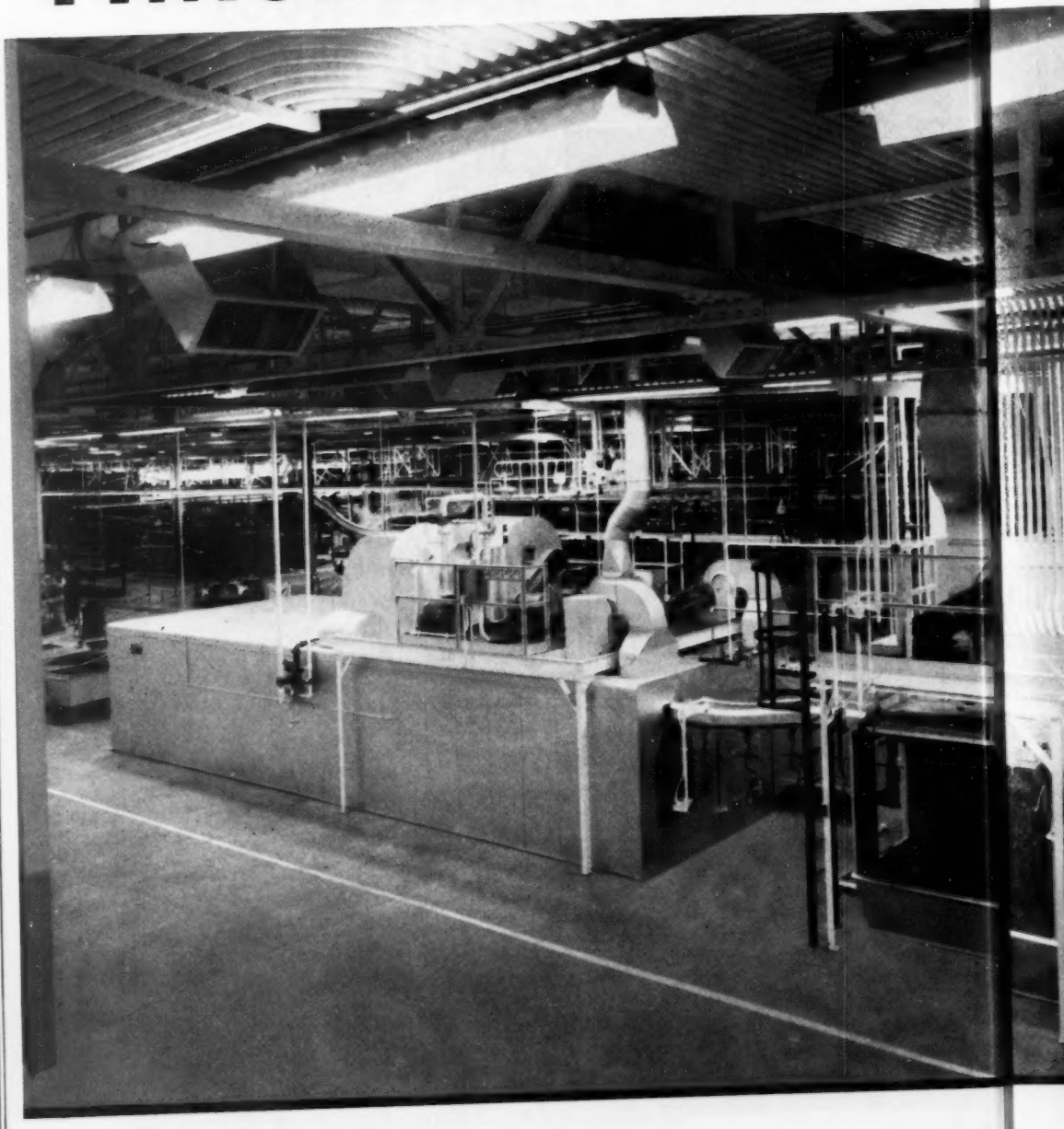

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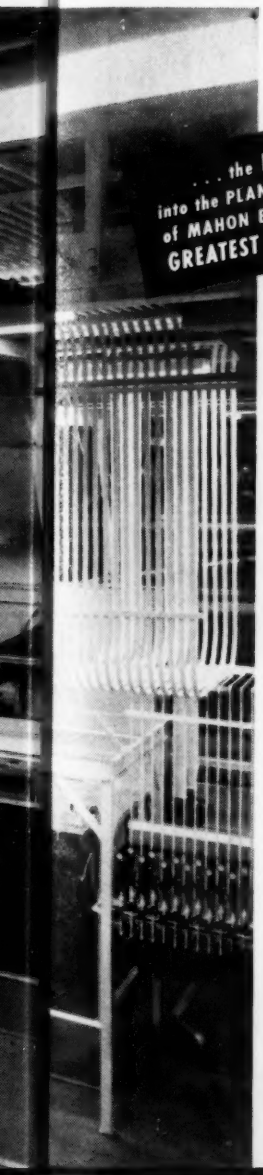

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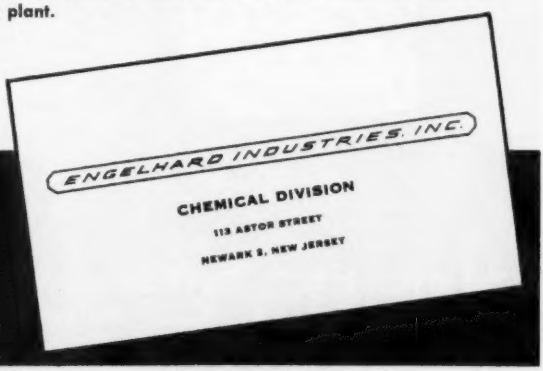

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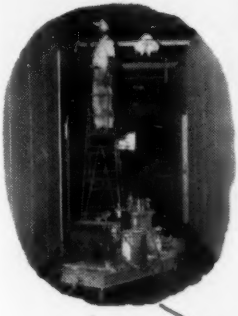

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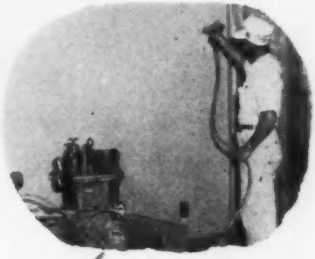

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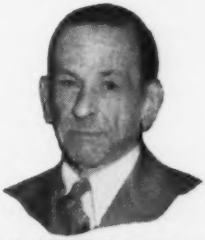

H. LEROY BEAVER
Contributing Editor

products finishing

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Improving Your Wrinkle Painting

Specific suggestions for controlling baking cycles and methods of application so as to produce wrinkle finishes of uniform color and texture . . .

By **HAROLD D. KAISER**
and
THOMAS G. O'BRIEN
International Business Machines Corp.
Military Products Division
Kingston, New York

Wrinkle finishes have become popular in recent years as decorative finishes for metals. They combine eye appeal and durability, and since they disguise minor blemishes in the basis metal, they save the manufacturer money by permitting him to eliminate expensive grinding and polishing operations.

To get the uniformity required by quality-conscious manufacturers, however, wrinkle paints must wrinkle to the same texture on every application. There are definite restrictions on the way a wrinkle enamel can be applied and processed if this uniformity is to be attained.

Because of the problems inherent in the application and processing of wrinkle enamels, both IBM and the company's subcontractors have had considerable difficulty in using such finishes in production operations. To overcome these difficulties, IBM personnel have recently devoted much time and intensive effort to studying the manufacture and application of these paints, with special attention directed to the problems of baking and reworking.

Most of the work summarized here was done with two paints: Pratt and Lambert Wrinkle Enamel, Dove Gray (IBM P/N 600-1301) and Pearl Gray (IBM P/N 6001304). These comments apply specifically to them. However, with suitable modifications in temperature, time, and so on, as recommended by the manufacturer, these suggestions can be applied to all wrinkle finishes.

Baking is probably the most critical factor involved in the application and processing of wrinkle

paints. Two of the more common difficulties caused by improper baking are softness and variations in color of the finish.

Temperatures that are too low and/or a baking cycle that is too short cause softness and fading (color variation).

Conversely, temperatures that are too high cause "browning off."

Where temperature trouble is encountered, the accuracy of oven-dial temperature readings should be suspected. Unfortunately, there are instances in which oven dials do not record oven temperatures correctly. It has been found, for example, that because of instrument error, thermocouple placement, erratic air circulation, and so forth, the oven dial may give readings as much as 20 deg. F. in error.

If such a situation is suspected, actual oven temperatures at various locations in the oven can be obtained by using a recording thermometer and smoke charts. The difference between the dial reading and the actual oven temperature can then be compensated for accordingly.

If, for example, the dial is set at 250 deg. F. and the smoke chart shows the actual temperature is 240 deg. F., then the simplest way to make the correction is to move the dial to 260 deg. F. and recheck the oven. If the actual oven temperature now averages 250 deg. F., the dial should be left at the new mark. **If the oven has more than a 10 deg. F. variation** between the high and low points of the cycle, the temperature cannot be set to average 250 F. since the variation above and below the baking range would dam-

THOMAS G. O'BRIEN joined IBM in January, 1953. In 1956 he began to work on painting and color-matching problems. As a quality analyst, Mr. O'Brien is currently engaged in setting up acceptance standards and tolerances for painted parts, and in the use of instrumental checking of color matching on production parts.

HAROLD D. KAISER joined IBM'S Military Products Division plant at Kingston, N. Y., in April, 1956. In his present position as an associate chemist, Mr. Kaiser has encountered a variety of chemical and finishing problems.

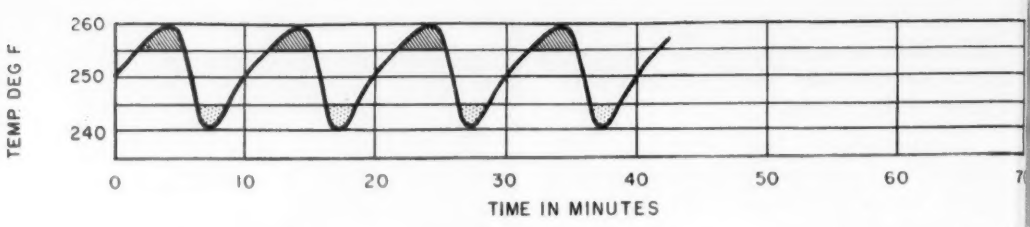


Fig. 1—Graph showing record of a baking cycle with wide temperature variation.

age the finish. However, if the variation is not over 20 deg. F., it can be compensated for by using data obtained from the smoke charts.

Assume an especially bad situation in which the oven has a range of 20 deg. F. between the high and low points of a 10-minute cycle. If, as is shown in Fig. 1, the oven is set to average 250 deg. F., then the high point would come at 260 deg. F. and the low at 240 deg. F. The portion of the cycle above 255 deg. F. (shaded area on graph) would cause danger of browning the paint and the part below 245 deg. F. (dotted) would be useless for curing the paint and could possibly cause softness.

To compensate for this condition, the oven should be adjusted as is shown in Fig. 2. It should be set so that the highest temperature reached is 255 deg. F. Then the time that the oven is below 245 deg. F. (shaded) should be totalled and this time added to the cycle (dotted extension of curve). It can be seen from Fig. 2 that, in this case, the oven is below 245 deg. F. for some 16 out of the 45 minutes. Therefore, 16 minutes of effective curing time must be added to the baking cycle.

Because the oven is also below baking temperature during part of the extended portion of the cycle, 22 minutes must actually be added to the cycle. Thus, a total time of 67 minutes is required in obtaining 45 minutes of effective baking time from the oven. (This figure does not include stabilization time, which will be discussed later.) If the oven has a cycle variation greater than 20 deg. F., it should not be used for wrinkle paint!

Once the baking cycle is started, it should not be interrupted until the parts have baked 45-50 minutes

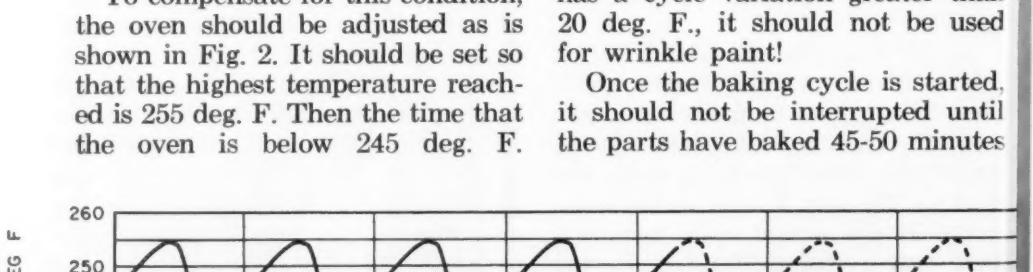


Fig. 2—Graph showing record of a baking cycle that has been adjusted so that the finish will cure properly. (Illustrations courtesy International Business Machines Corporation.)

at 250 deg. F. The 45-minute cycle should start when the oven temperature is stabilized at 250 deg. F.

Unfortunately, there is no assurance that the oven dial will register 250 deg. F. at the time that this temperature is actually reached. In some cases it has been found that the oven dial indicates stabilization when the baking area of the oven is still 10-20 deg. F. below the required temperature and that an additional 10-15 minutes is required to reach the proper temperature. In most cases, this delay is caused by the improper placement of the thermocouple sensing element.

This trouble can be detected by using a smoke chart to check the oven and by noting the time the oven dial indicates stabilization compared with the actual stabilization time as indicated by the chart. Compensation can be achieved by using the oven dial stabilization point as a starting-time point and by adding the difference between the indicated and actual stabilization points to the 45-minute time cycle.

For example, suppose that a smoke-chart recording indicates that the oven does not actually reach 250 deg. F. until 12 minutes after the oven dial stabilizes at 250 deg. F. These 12 minutes would then be added to the 45-minute baking cycle, making a total time cycle of 57 minutes from the time the oven dial stabilizes at 250 deg. F.

Timing the baking cycle from the moment the oven dial stabilizes also eliminates variations caused by oven loads that vary in size. By using the method outlined above, there is no need to compensate for type of part or size of load. Of course, the size of the load should not be so great as to cause excessive fouling and poor air circulation, which would also cause variations in color and texture.

Oven regulation and baking-cycle are not the only variables that must be controlled to produce wrinkle finishes of consistent color and texture. Frequently the texture may be either too smooth or too coarse even when the right degree of hardness and the exact color required are obtained. These conditions are usually caused by faulty application of the paint. Texture of a wrinkle enamel depends on the thickness of the coating. Flatness ordinarily results from too thin a coating (less than five mils); sagging and thick, coarse wrinkles result from too thick a coat (greater than eight mils). A few simple precautions will ensure an optimum thickness.

Thinners should never be used with wrinkle paints since they have a decided tendency to "kill" the wrinkle. If the paint seems too thick for proper spray application, it is probably because the paint is too cold. The paint should be stored in a location where it will not be subjected to temperatures below 50 deg. F., or above 110 deg. F. It should be brought into the spraying area at least 24 hours prior to use to bring it to room temperature.

"For best results a fairly close spray pattern should be used."

Hot-spray equipment is helpful. Use it to heat paint up to 130-140 deg. F. Cold-spray methods can be used with complete success, but greater precautions must be taken to prevent sagging and running if no heat is used.

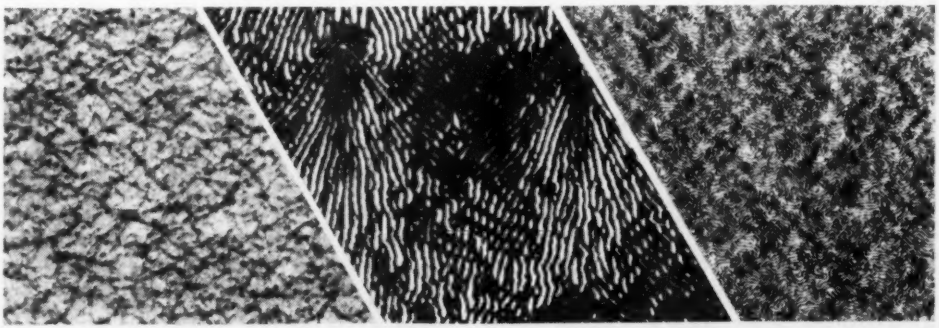
Air pressure to the gun should be approximately 45-50 pounds gage, and the paint pressure should be about 15 pounds gage. These pressures must be checked with the gun in operation to be sure that actual working pressures are obtained. If the gun is idle for a half hour or longer, the pressure to the paint should be relieved.

For the best results, a fairly close spray pattern should be used. A six-inch fan at a distance of nine inches from the nozzle gives satisfactory results. The gun should be aimed at the edge of the part or panel first. Each succeeding spray movement is then directed at the edge of the previous application. This gives the overlap needed to assure complete coverage. The second coat is applied in the same manner but perpendicular to the first application. If the gun is moved in a line parallel to the surface and about nine inches from it at a speed of about one foot per second, sufficient paint will be applied in two coats to give the desired five-eight mil wet-film thickness.

Wet-film thickness must be checked periodically to be sure that it is within the specified range. It can be easily and quickly checked by using an Interchemical Wet-Film Thickness Gage. If such a gage is not available, an indication of the thickness may be obtained by observing the parts prior to baking. If a slight texturing is visible, the paint is not too thick.

If the parts are allowed to air-dry for at least fifteen minutes before being placed in the oven, the chances of sagging are greatly reduced. A longer drying period (up to two hours) would be helpful, but it increases the chance of dust and dirt falling on the part.

By observing the precautions and following the practices outlined it is



Examples of three patterns obtained from different wrinkle-finish formulations.

entirely possible to produce wrinkle finishes that are uniform in both color and texture. It should be realized, however, that it is not quite as simple in actual practice as it may originally appear to be. There are a number of things that can impair the quality of the wrinkle finish between the time the paint is applied and the time the finished part reaches the purchaser. Such defects as chips, scratches, dirt, and "fisheyes" may create a need for rework.

Parts which show extensive paint damage are best reworked by stripping the paint from the part and treating it as if it were a new part. If this type of rework is not feasible, an adequate job can often by done by sanding the surface smooth, applying a coat of gray primer, baking, and applying the wrinkle enamel in the normal manner.

Small blemishes such as "fisheyes," which are not conspicuously visible in the enamel, can often be eliminated without reworking. This can best be done by inspecting the part upon its removal from the oven, when it is still near the baking temperature and the wrinkle film still has considerable elasticity. If, at this time, the thumb is placed over the blemish and the film is gently moved with a sliding motion, the film will gradually recover its configuration and the blemish will disappear. Naturally the pressure must be carefully applied in order not to tear the film.

It has been found through experiment that when all the above variables are considered and controlled, an acceptable wrinkle finish can be obtained on a regular production basis. Conversely, it has also been learned that if any one of these variables is disregarded, trouble is sure to follow.

It has been definitely established that instances of softness and faulty coloring in wrinkle enamels are commonly caused by improper methods of application and/or baking. When these faulty conditions are corrected, a hard, evenly textured and correctly colored finish is obtained. This control can be achieved by following the practices described here, particularly with respect to proper instrumentation to provide the degree of control necessary (recording thermometer, wet-film gage). The cost of such instrumentation and the time involved in its use is more than offset by the improved quality of the finished product.

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How to Engineer an Automatic Plating Installation

What to consider when converting to automatic plating . . . specific recommendations on planning, type of machine, tanks, auxiliary equipment, racks, agitation, other factors . . .

By **FRED G. BRUNE**

Manager, In-Process Inspection
Missile Division
Chrysler Corporation
Detroit, Michigan

The basic factors to be considered when installing automatic plating machines were discussed in an article "From Semi To Full Automatic Plating."[1] The next problem is how to obtain the best automatic plating installation. The method suggested herein will provide a check on the basic factors and enable you to select the equipment best suited for your operation.

Planning

Usually eight to twelve months are required from initial planning to full operation of an automatic plating unit; thus establishment of a time schedule at the beginning is essential. A minimum time schedule is as follows:

Planning	One month
Engineering	One month
Purchasing	One month
Delivery	Three months
Installation	Two months
Trial Operations	One month
Total	Nine months minimum.

Basic Considerations

Planning starts with your outline of basic considerations — what you wish to accomplish. It is important to know what metal(s) will be deposited on what basis metal(s); how thick the deposit(s) must be; how quickly it must be deposited; and on what quantity of parts.

Next, it is important to know whether the metal will be buffed and how it will be buffed, for this determines the method in which the metal will be cleaned. For many plants where buffing and fabrication are automatic or will be converted

Fred G. Brune

to automatic, cleaning prior to plating is one of the biggest single considerations. A precleaning machine in such a situation is desirable because the cost of such a machine is less than the cost of equivalent stations in an automatic plating machine; modifications of the precleaning cycle can be made more easily and at less cost; and the cycle time of the automatic is thus decreased.

It is also important to know whether post treatments will be required, such as chromate coatings, blackening treatments, and so on. Post-treatment cycles are usually simple and can be made part of the plating machine; but if special rinsing, drying or multiple-stage treatments are necessary, a separate post-treatment machine would have similar advantages to those listed for pretreatment machines.

Basic Decisions

Having the above information, the engineer calls in the cleaning and plating solution suppliers. He gives the vendors this information and each of them then tells how his product will do the job, how many stations are needed, and what auxiliary equipment is required.

Now the finishing engineer must choose the cleaning and plating processes and products he will use. Then he can establish his cycle according to the manufacturers' recommendations for their products.

His cleaning cycle, for instance, might be as follows:

1. Soak clean.
2. Direct electroclean.
3. Reverse electroclean.
4. Warm rinse.
5. Cold spray.
6. Acid dip.
7. Cold rinse.
8. Copper strike.

It is important to decide at this point whether a straight-line or return-type plating machine is more suitable. This decision should be based on the space available, the cost, and the plant layout and maferial flow. In some plants it is desirable to have plated products return to the loading point for unloading; in others production flows more smoothly if the machine can be unloaded in another part of the plant.

Consideration should also be given to multiple-lane automatic plating machines. A number of such machines have been built with a wall separating the lanes, so that several different types of parts can be processed at the same time. Such a machine also permits production to continue in adjacent lanes while trouble is being corrected in one lane. And problems with anode placement and anode corrosion as well as current distribution are simplified.

Auxiliary Equipment

Now that the engineer has a tentative plan for the type of machine and the cycle, he can proceed to consider auxiliary equipment that

will be needed, before he makes up his final specifications.

Auxiliary equipment includes make-up tanks, filters, heat exchangers, electro-purification equipment, diaphragms[2], agitation equipment, piping and valving. Figure 1 shows a layout of auxiliary equipment for a nickel plating tank. Note that the solution flows from the plating tank to the electro-purification tank by gravity, then through pumps to the filters and on through the heat exchanger back to the plating tank.[3]

Makeup and Storage Tanks

The use of small tanks for mixing chemical additions to plating solutions facilitates the dissolving and filtration of chemicals before they are added. It helps to prevent dirt and solids from getting into the plating solution and causing roughness and other problems. Mixing tanks also reduce the labor required to make additions, and improve the housekeeping in the department. They decrease the chance of getting chemicals on machinery and equipment, to cause future corrosion or malfunction.

Storage tanks are useful in performing chemical treatments and purifications required to obtain best results from modern large-volume

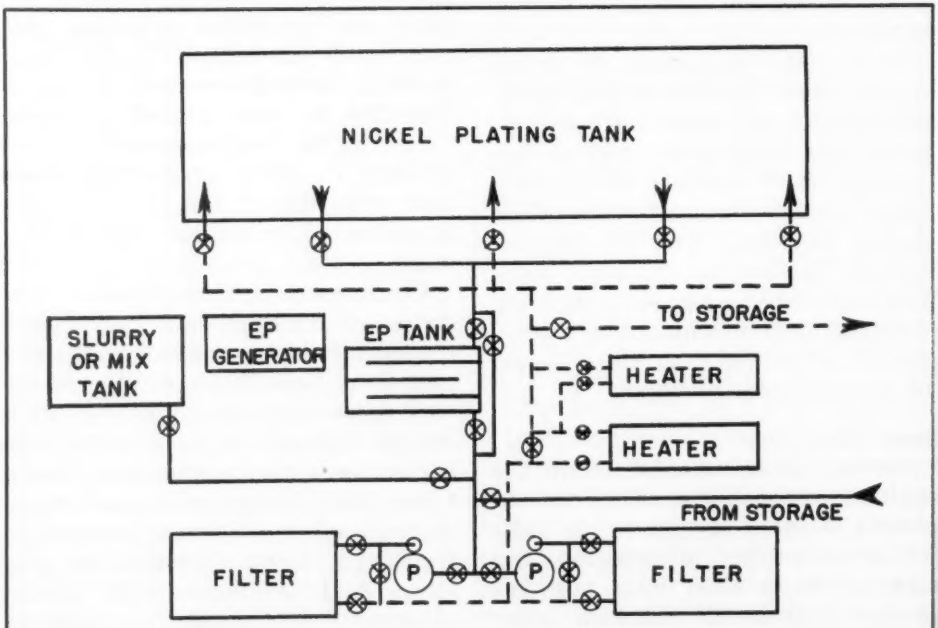

Fig. 1—General layout showing auxiliary equipment for a large nickel plating tank.

plating solutions. Storage tanks should be 15 to 20 per cent larger than the plating tank to accommodate the additional solution resulting from anode and plating tank "wash-down" and filter cleaning.[4]

Filtration Equipment

The most important piece of equipment for high-quality production plating is the filter.[5,6] Many types of filters are available; the general requirement is to have sufficient capacity to keep the solution clean under the plant's operating conditions. Sufficient filtering capacity should be provided so that the tank volume can be filtered in 40 minutes with clean filters. For a 10,000-gallon tank, a filtration rate of 15,000 g.p.h. is recommended. The filter rate falls off rapidly as the filter removes sludge from the solution. Use of multiple filtration units permits continuous filtering, since one filter can be cleaned while the others remain in operation.

The system shown in Figure 1 is advantageous in that it removes any sludge formed during electro-purification before the material reaches the heat exchanger, and this permits the heat exchanger to operate more efficiently.

Heat Exchangers

Heat-exchanger capacity should be adequate to heat the solution from 60 deg. F. to operating temperature in six hours. A system sized in this manner will be large enough to restore the heat lost during normal operation. Special consideration must be given to plating systems that operate with vigorous agitation, diaphragms and so on. It is wise to install heating equipment large enough so that a change in conditions can be accommodated without difficulty.

Pumping and Piping

Pumping and piping are two items which are frequently not given sufficient attention. A grease-seal type of pump has no place in plating operations. Only water-seal pumps should be used. Pump location should be such that the suction side of the pump is always flooded. This means that it should be level with or below the bottom of the tank. The author made one of the first large plating installations using Saran-lined steel pipe. The main advantage of pipe of this type is that it can be cut and fitted on the job. The following data lists recommended pipe sizes for various desired rates of flow:

TABLE I

Rate of Flow (gallons per minute)	Size of Saran-Lined Pipe (inches)
5 or less	1
5 to 10	1¼
10 to 20	1½
20 to 40	2
40 to 60	2½
60 to 90	3
90 to 140	4
140 to 360	6

Rates of flow in Table I have been calculated to be low enough so that, unless unusually long distances are involved, or exceedingly complicated turns and valving are involved, no allowance need be made for fluid flow and friction loss in the system. A pump large enough to produce a sufficent flow for the filter requirements will be adequate.

Two other problems that should be considered are the sizing of gravity-feed solution lines to the electro-purification tank or to the

"Discharge of solution back into the plating tank should be made into the upper portion of the tank."

filters and heat exchangers, and return openings for solution discharge. The electro-purification tank can be a part of the plating tank, or a separate tank. A separate unit is better, since diffusion of impurities can be reversed during shutdown time if all openings are not closed. If the unit is near the plating tank, a six-inch pipe will provide a gravity flow of approximately 10,000 gallons per hour with approximately one-foot difference in solution level. A four-inch pipe will only flow 4,000 gallons per hour for the same difference in head.

Discharge of solution back into the plating tank should be made into the upper portion of the tank. The intake lines of the filter system should be from sumps in the bottom of the tank. The normal circulation of the system then tends to remove foreign matter with a minimum of effort. A sketch of a discharge pipe system used in a nickel plating tank is shown in Figure 2. If the discharge opening has the same area as the cross-sectional area of the pipe used, the solution movement will not disturb most operations.

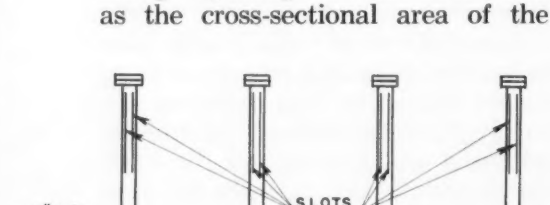

Fig. 2—Typical solution discharge standpipes. Four slots, each 1/8-inch by 18 inches long, are cut into the upper part of each pipe.

At a flow rate of eight linear feet per second, the solution will have a noticeable flow for about 30 inches. Flow of fluids from most discharge systems cannot be calculated exactly. If the tank is filled with water and small amounts of a colored dye are added, however, both circulation and discharge conditions can be observed and altered as necessary.

Plating Racks

The size of the work rack area, and the production in racks per hour must be determined. These will vary greatly, but it is possible to determine limits.

To get the maximum number of pieces and area per rack in plating equipment where the variation of size and shape of parts is unknown, the following data is useful:

1. The maximum rack length must be estimated, based on possible part length and the building area in which the equipment is to be installed; this ordinarily will be between 48 and 100 inches.
2. The width of the rack should be 1/3 to ½ of the length. The thickness of the rack box should then be between 1/3 and ½ of the width; 10 inches would be the minimum for a 48-inch-long rack. Approximately 1 inch should be added for each 6 inches of added length.
3. The distance between rack carrier centers should be at least six inches wider than the rack width for a 48-inch-long rack, with an

additional inch for each 6 inches of length.

4. The anode-to-cathode-rod distance[7] should be 2½ to 2¾ times the rack-box thickness. (The larger number should be used with thinner rack boxes.)

Operation of the auxiliary equipment is important; for example, a rapid shutdown of the system could cause salts to form in the heat exchanger. Later, these could be washed directly into the plating tank. The equipment, the system and operating personnel available must all be considered during engineering and installation of a setup. Good equipment improperly operated will produce worse results than poor equipment operated in the best possible manner.

General Considerations

Even after all the auxiliary equipment has been planned and the general cycle has been decided upon, there are other factors that must be considered. Each plant will have special problems that must enter into the final specifications if the most efficient system is to be attained.

Flexibility is important: Features such as rapid transfers, delayed cycles, bypasses, and so on, provide some of the flexibility of manual operation in automatic plating.

Future needs are important. The engineer should forecast future production needs and anticipate changes in plating processes that would require equipment modification. Then these factors can be taken into consideration in the design stage of the machine.

Space is sometimes limited. This factor should be considered only when selecting the machine type or layout, however. If the space available is not adequate for the equipment required, it is wise to modify the building to allot more space or else specify equipment with lower production capacity. Since large automatic equipment can cost as much as 4½ times the value of the building area used, building modification or new quarters should be requested if the existing plant area is not adequate.

Scheduling can make a difference in machine size necessary. The interval of operation must be considered.[1] Time is often lost when loading or unloading a machine. This time loss can be reduced if it is possible to load the machine before the regular shift begins. If this is impossible, it may be necessary to purchase two units to get the required capacity. The number of shifts per day is also a factor. Usually for automatics having a 45-minute to two-hour time cycle, a two-shift operation is necessary to operate economically. For a unit with a cycle time exceeding two hours, a three-shift, five-day week becomes the desirable minimum.

Specifications

Having obtained all the required information, the engineer is now ready to write his specifications for the machine and obtain quotations from the vendors. A sample specification is shown below:

Sample Specification for a Plating Machine

Production—50 racks per hour, 2 racks per carrier.

Surface area—Six sq. ft. per rack.

Rack work area—48 inches in length by 21 inches in direction of travel

"Critical points are those at which racks emerge from all cleaners, copper strike and copper plate."

by 12 inches thick. From the top of the 48-inch length it shall be five inches to the top of the tank. From the top of the tank to the top of the work carrier shall be eight inches. The work carrier must accommodate a rack with the dimension listed (that is, 13 inches from the top of the rack to the top inside of the hook). The hook shall have its open end moving in the direction of travel.

Anode centers—36 inches.

Transfer time—As rapid as possible. Critical points are those at which racks emerge from all cleaners, copper strike and copper plate. Sprays should be provided to keep work wetted at these points.

General notes — All tank openings must clear any machine columns (that is, it should be possible to mount flanged pipe the same size as tank flanges at an angle of 90 deg. to tank walls). There shall be a minimum clearance of 12 inches between the bottom of the rack and tanks. There must be a minimum of 12 inches clearance at each end of each copper and nickel tank to allow for internal piping systems. All tanks must be shipped with blind covers over flanges. All gears, sprockets, and so on must be covered. Bus bar calculation shall be based on ¼ by four-inch copper bar for a maximum current of 750 amperes. Details as to location will depend on tank sizes.

Details on Tanks and Operating Conditions

All tanks should be made of ¼-inch steel plate except the copper and nickel tanks, which are to be ⅜ inch. Tanks to be welded inside and outside, reinforced around the top with three by three by ⅜-inch angle and properly braced, as required. All tanks should be cleaned of rust and scale and painted on the outside, with the necessary copper rods and terminals included on electrified tanks.

Electrocleaner—Four minutes time, 75 a.s.f. at 200 deg. F. Overflow weir and two-inch drain on outside. Complete with steel heating coil on exit side. To be supplied with exhaust duct system.

NOTE: Each tank requirement must be detailed.

Sample of Items to be Included on a Major Tank in a Plating Machine

Copper Plate — 25 minutes at 50 a.s.f. Tank to be sloped from ends to a center sump with two flanged openings. Two flanged openings on the outside bottom corners, also two flanged openings on the outside at the ends 16 inches from top of tank. (Openings approximately three inches in diameter.) Tank to be equipped for use of diaphragms. Channel slides to be provided on sides and center so that screens approximately three feet wide and ¾ inch thick can be inserted. Bottom of diaphragm structure six inches above tank bottom to be closed and drained toward center. To be lined with ¼-inch rubber; type to be specified later. No heating coils required.

Copper Tank

(a) *Agitation piping.* This will require two tank outlets each

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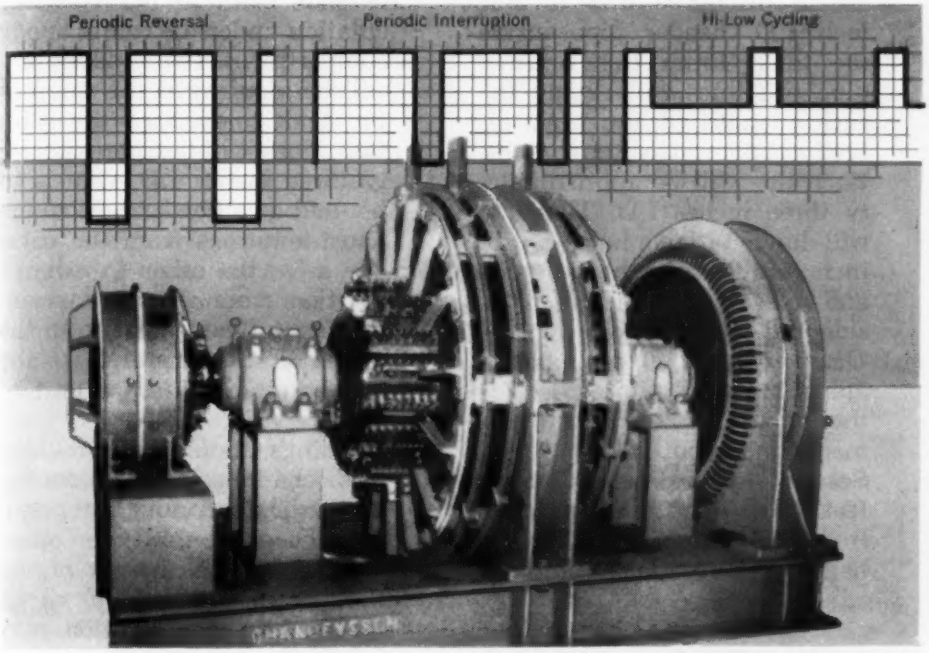

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approximately four inches I.D. One outlet to discharge directly into the tank, the other outlet to discharge into a four inch I.D. header pipe inside the tank. From this header pipe two lines will extend the entire length of the tank directly under the cathodes. Each line will be approximately three inches I.D. This line will have 1/8-inch holes on 18 inch centers. The header pipe and lines should be coated inside and out.

(b) *Diaphragms and piping.* Diaphragms shall be provided for the anodes. These compartments must be solution tight. Screens approximately three feet wide must be removable from the diaphragms so that bags can be placed around the screens and the screens reinserted into the tank. Provision must be made so that the cathode solution has free circulation under the center anode compartment. Two header pipes will be required at the sump of the tank to exhaust the solution. They will be approximately three inches I.D. One is to be used as a header pipe to exhaust solutions from the cathode area, the other to exhaust solution from the anode compartment. The piping from the anode compartment to the header pipe is to be a part of the proposal.

(c) Openings should be provided to discharge solutions from the heat exchanger and filter system. There should be two openings, one on each end of the tank, approximately three inches I.D. The solution may be discharged either through boxes on each end of the tank below the solution level or through vertical slotted stand pipes.

"No, I don't harbor any animosity about the crowded conditions—where would I put it?"

Sample of General Comments on Machine

Both the copper and nickel solutions will be passed through the filter-heat exchanger system at a rate in gallons per hour equal to the tank volume in gallons. The slots in the discharge boxes and/or vertical stand pipes should be such that the solution does not flow out at a rate greater than 10 linear feet per minute.

All tank outlets must be in true vertical and horizontal positions so that piping from the tanks to auxiliary equipment can be accomplish-

ed. The holes in the flanged outlets must be on true horizontal and vertical lines so that other piping and valves can be properly mounted.

Conclusion

Frequently, the cost of purchasing and installing equipment is made the controlling factor in selecting equipment. This should not be so. The prime objective should be production of the specified quality at the lowest possible cost. If this is not done, excessive rejects, loss of customers and modification expense will prove the folly of installing the wrong equipment.

To avoid such a situation, specifications should be well written and detailed. Then all the vendors can bid on the same basis. Making cost the deciding factor after everyone understands exactly what equipment he is to provide is good business.

ACKNOWLEDGMENT

This article is based on the writer's association with several companies. It covers only engineering details affecting the actual plating operation. Specific acknowledgment is made to past assistance received from M. K. Young of The Electric Auto-Lite Company and Ray A. Barry of Allied Research Products, Inc.

REFERENCES

[1]Fred G. Brune, "From Semi to Full Automatic Plating." PRODUCTS FINISHING, 20, No. 1, page 44 (October, 1955).

[2]Ezra A. Blount, "Diaphragm Tanks Promote Plating Progress," PRODUCTS FINISHING, 14, No. 10, page 12 (July, 1950).

[3]Ezra A. Blount, "Production Plating of Die Cast Automotive Trim," PRODUCTS FINISHING, 13, No. 10, page 14 (July, 1949).

[4]Fred G. Brune, "Maintenance Operations in Production Plating," PRODUCTS FINISHING, 19, No. 8, page 32 (May, 1955).

[5]G. M. Cole, "Filtration for Plating," *Plating*, 35, No. 9, page 904, (September, 1948).

[6]Ezra A. Blount, "Filter Out Your Plating Rejects," PRODUCTS FINISHING, 15, No. 3, page 24 (December, 1950).

[7]For additional information on anode-to-cathode distance see "Conservation of Nickel in Electroplating," *Metal Progress*, page 89, (December, 1956).

★ ★ ★

General Galvanizing: A Manual of Good Practice. Published by the Hot Dip Galvanizers Association, 34 Berkeley Square W. 1, London, England. For sale by the Association.

The Manual of Good Practice is designed to give guidance in the practical aspects of the galvanizing process. An introductory chapter outlines the process, distinguishes between the wet and dry methods, and also describes the structure of the coating and the effect of different basis materials. Operations such as pickling and fluxing are described and special attention is paid to the preparation of castings for galvanizing. Full consideration is given to the control of preflux solutions in the dry process and the relative costs and merits of ammonium chloride and zinc ammonium chloride as fluxes in wet galvanizing are compared. The section dealing with the actual dipping of the work examines the factors which affect the thickness, uniformity of the coating.

Further chapters deal with recommendations on the control of ash and dross formation during galvanizing, and methods of recovery of zinc. Handling and treatment after galvanizing are described and an account of inspection and testing includes reference to possible defects in the coating, stresses the importance of coating thickness and discusses the methods of measuring it. The prevention of white rust, which sometimes occurs on newly galvanized articles, is discussed in the chapter on transport and storage.

Testing Finishes for the Future

New GM test center in Florida opens its doors for scientific torturing of products being developed for automobiles of the future . . .

Ten years ago a General Motors supplier submitted a sample of a clear acrylic lacquer for evaluation as a coating on chromium plated surfaces. It held up so well when subjected to weathering tests at GM's Florida Test Field that intensive development work was begun on acrylic lacquers. Result: all 1959 GM cars are finished with an acrylic lacquer that can take up to three years average weathering with no more care than washing and still retain most of its original gloss.

In finish technology the acrylics were considered the biggest breakthrough in durability improvement since the early 1920's when nitrocellulose lacquers were introduced.

This is a dramatic example of the importance of accelerated weathering tests in development of new finishes. These tests have become a vital part of GM's evaluation, testing and development program, so important that the company recently opened a new 10-acre test field for automotive materials in South Dade County, Florida.

Described as "a piece of GM

Technical Center," the facility is the most completely outfitted weathering station in the auto industry, replaces a 30-year-old site near Miami's International Airport.

The original test site set up by the late "Boss" Kettering* — then general manager of the company's research laboratories—and Ralph J. Wirshing (now head of GM Research Laboratories' Chemistry Department) consisted of a small garage with three primitive exposure racks and a couple of orange crates for chairs. It was intended to test paints and finishes under the intense sunlight and salt air of the Sunshine State.

In contrast, the new facility covers a ten-acre area, includes 750 lineal feet of aluminum exposure racks, 10,000 square feet of building space.

In addition to testing paints, exposure racks are now decked with samples of plating, upholstery fabrics, plastic and rubber mouldings, decorative emblems, locomotive finishes, rear view mirrors, head, tail and turn-lamp lenses, steering wheels, horn rings, truck beds—virtually every automotive part, inside and out, that undergoes direct or indirect weathering.

The main building contains offices, a laboratory, photographic dark room, an instrumentation room, humidity room, paint spray booth, shop and shipping room, plus a room for testing Frigidaire Division household appliances.

On the field itself are thirty 5-by-12-foot panel racks for 5,000 individual paint sample panels and fifteen 50-foot sections of racks beneath glass frames. These are for exposure of interior automotive products not exposed to rainfall.

The new exposure racks are portable. In advance of hurricane alerts each complete rack can be lifted by fork truck and moved to safe storage. Each rack can be pivoted to expose samples at any angle.

The facility now averages 2,000 samples per month—approximately 25,000 tests annually. Exposure

*Dr. Charles F. Kettering, 82, passed away on November 25, 1958.

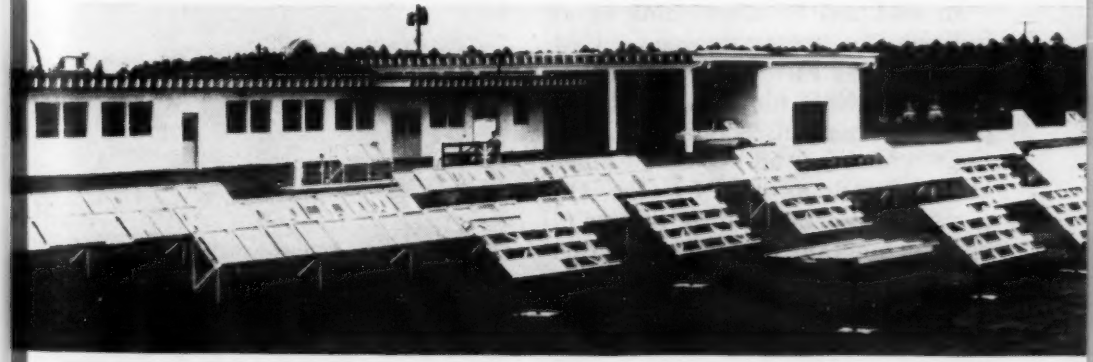

Fig. 1 — Exposure racks such as these are used to subject more than 25,000 samples annually to Florida sunshine and dew, providing a quick check of weather resistance.

Fig. 2 — This humidity room has constant 100-degree temperature and 100 per cent relative humidity. It is used to accelerate growth of mildew on finish samples. Spray nozzle at right maintains humidity in room.

periods to Florida's sun, dew and rainfall vary from three months, (thanks to modern weathering detection techniques) to three years. Added to these, meantime, are thousands of re-exposures of varying time limits.

Samples are received from most of GM's 44 operating divisions and subsidiaries, including GM of Canada, Ltd., and German, British, South African, Australian and other GM overseas subsidiaries.

In addition to functioning as an independent testing service for GM, Florida Test Field also handles exposure projects for many GM suppliers, either in connection with their experimental work or their current products used by GM. But a more important phase of the facility's function is its basic evaluation of products or processes in research or early development stages. **The Florida Test Field actually has four assignments.** First, it is a proving ground for ideas or theories. Second, it implements the company's Chemistry Department's program of finding and developing new materials. Third, it figures importantly in modifications and improvements of materials now in use. And, fourth, it serves as a quality-control checkpoint.

". . . the prevailing theory of finish deterioration was that sunlight ruined paint films."

Miami, Florida, was chosen as the location for the original test site because the prevailing theory of finish deterioration was that sunlight ruined paint films. Miami had sunshine to spare.

Paradoxically, the combination of factors that make South Florida's climate attractive to people is also toughest on their automobiles, buses and trucks.

Therefore, an auto finish that en-

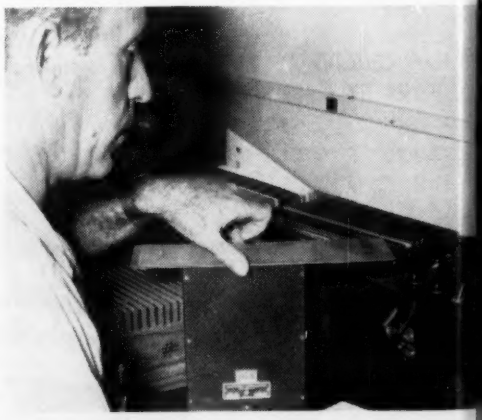

Fig. 3—After exposure, the painted samples are rated for gloss by this gloss meter. Automotive finishes developed since the war have shown marked improvement in their ability to retain gloss, even under tough test conditions encountered at Florida proving ground.

". . . it was learned that sunlight is not the only enemy of the automobile's showroom look."

dures well in South Florida will be even more durable elsewhere in the United States. This has been proved repeatedly in actual exposure tests at various locations in the country.

GM's continuous testing around Miami has in no small measure aided researchers in steadily upgrading durability and appearance of automotive materials everywhere — in large and small increments.

Such improvements in finishes may not always be obvious to the car owner, particularly on a year-to-year basis.

But to the staff of GM's Florida Test Field the progress with finishes has been dramatic. The staff can illustrate this many times over simply by putting a sample of 1948 lacquer on a test rack beside a 1958 lacquer. The difference in luster is obvious after several months of exposure.

Fig. 5 — These pyrheliometers or "sunshine recorders" automatically record total sunshine or solar radiation hours at GM's Florida Test Field. These two instruments are under glass, while a third is exposed to atmosphere.

The durability and luster-retention contrast is even greater, moreover, when a 1958 car finish sample is exposed beside a sample of the 1959 acrylic lacquers.

Some years after GM began subjecting its finishes to Florida sunlight it was learned that sunlight is not the only enemy of the automobile's showroom look. Actually the combination of sunlight and dew (moisture) is responsible for finish deterioration.

The new theory led to a research program for accurate recording of the weather's vagaries. In short, a scientific approach was needed. Weather testing could be improved if it consisted of more than simply hanging samples on racks and observing their deterioration from time to time. Amount of sunshine and moisture and length of exposure

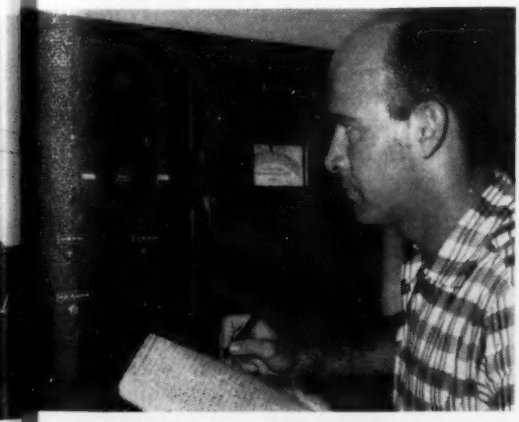

Fig. 4—Instrument room contains many recorders such as these to maintain continuous records of amount of sunlight, dew, rainfall and surface temperatures of various samples. Huge data accumulations give researchers clues to weather variables affecting finishes.

"In a typical year Fisher Body Division uses as much as 7,600,000 gallons of lacquers . . ."

to each are the important factors.

As a result, GM's new facility is as completely instrumented as any weather station, with several interesting refinements.

Among the special recording instruments in service at the new test field are:

1. The pyrheliometer or "sunshine recorder." Resembling a large-size electric light bulb, it records total sunshine hours. Two of these are always in service recording both direct and "under glass" exposure.

2. The "dewmeter." This gives an hourly record of how long a sample is wet with dew.

3. The "rainmeter." This automatically records how long samples are wet with rain. In addition, of course, there is a total-rainfall-recording instrument, standard for all weather stations.

4. A modified standard instrument that reports accurate surface temperatures of both paint and fabric samples.

5. The spectroheliometer. This separates various wave bands of the sun's rays. It measures their individual intensities and calculates the day's total. The instrument has been operating at the test field for two years and its data are still being analyzed to determine if there is a relation between intensities of various light wavebands and the weathering rate of selected paint samples.

Another device chills painted sample panels to a temperature slightly below the dew or moisture concentration point, thus creating a continuous artificial dew. Simultaneously it maintains another sample or "control" panel at a temperature slightly above the dew point, keeping it artificially dry despite the moisture content of the air.

Other standard weather bureau instruments continuously record temperature, humidity and wind velocity.

GM's consumption of paints certainly justifies its concern about improving finish quality. In a typical year Fisher Body Division uses as much as 7,600,000 gallons of lacquers, 3,500,000 gallons of primer and 9,000,000 gallons of thinners and reducers. This would be enough to cover completely with four coats of paint a four-lane highway 7,000

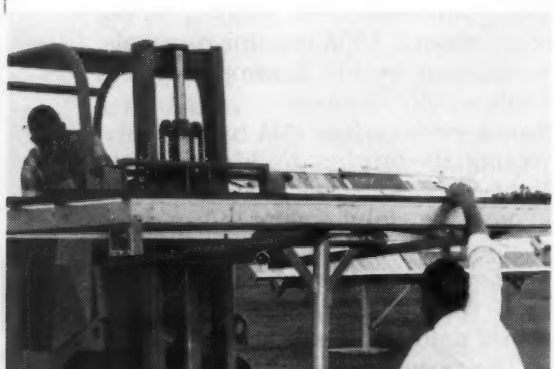

Fig. 6—Racks are constructed and mounted so that a fork truck can move them to shelter in advance of a hurricane.

miles long — the distance from Miami to Seattle, Washington, and back.

The GM Test Field in Florida is not the only place where the company evaluates its finishes. Survey teams watch the performance of automotive finishes on the streets and parking lots of various U. S. cities.

Every spring since shortly after World War II Miami has been the takeoff point for seven three-man teams.

Experienced in all phases of paint chemistry, production and application, these three-man teams patrol parking lots in Greater Miami, observing and noting how both GM and competitive cars withstand exposure to sunshine, moisture, heat, cold, dirt, gravel, insects, fog, smog, acids and salts.

Their annual itinerary is northward, always including parking lots at Washington, D. C., and Detroit, Michigan, plus any other special areas that may need investigating at the time.

The teams have a rating system for every car they inspect. When their surveys are completed, data are put on punch cards and fed into a big digital computer at GM Technical Center (Warren, Mich.) for evaluation.

The data feedback goes to each GM car division (Chevrolet, Pontiac, Oldsmobile, Buick and Cadillac) and Buick-Oldsmobile-Pontiac Assembly Division plants. The same information is available to paint suppliers and GM Research Laboratories' Chemistry Department.

On the survey teams are representatives of the GM car divisions, Fisher Body, paint-supplier companies and suppliers of various metal treating compounds.

Fig. 7—Iron filings make rusty spots on automobile finishes. William E. Laesch, manager of the test field, and Ralph J. Wirshing, head of GM Research Laboratories' Chemistry Department, examine the results, which simulate what happens to autos being shipped in freight cars when iron filings shower from overhead. Control samples at right are spotless. Change in shipping technique was recommended by testers to remedy problem.

There are several reasons for such surveys. First, however comprehensive the Florida Test Field studies may be, they cannot include all the weathering factors an automobile encounters.

Nor can they include occasional abuses an owner may inflict, either through carelessness or neglect—or use of cleaning and polishing methods or materials *not* recommended by the manufacturer.

It is also impossible to tell whether test-field results in Florida correlate with weathering results that actually occur in service. The

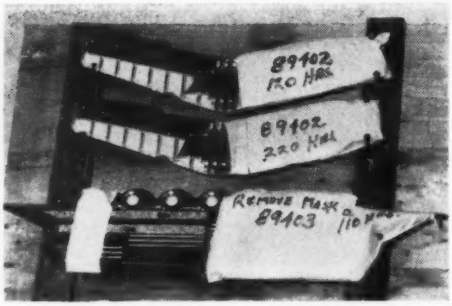

Fig. 8—Cadillac and Chevrolet emblems being tested for durability. (Photographs courtesy General Motors Corporation, Detroit.)

only way to find out whether the results correlate is to go out and look over the cars.

★ ★ ★

Water and Waste Control for the Plating Shop. By Dr. Joseph B. Kushner. Published by Joseph B. Kushner Electroplating School, 2509 Washington Ave., Evansville, Indiana. 100 pages. Price, $7.50.

A textbook for the plater who now has or soon will have problems in waste disposal and proper rinsing techniques. Tells how to reduce water bills, how to improve plating by proper rinsing techniques, how to minimize cost of waste disposal.

Typical chapters are entitled *The Case for Good Water in Plating; Disposal of Plating Plant Water; How to Minimize Dragout; Recovery Systems; Design of Rinse Tanks; Economic Analysis for Water and Waste Control;* and *Concentration Effect in Plating Baths.*

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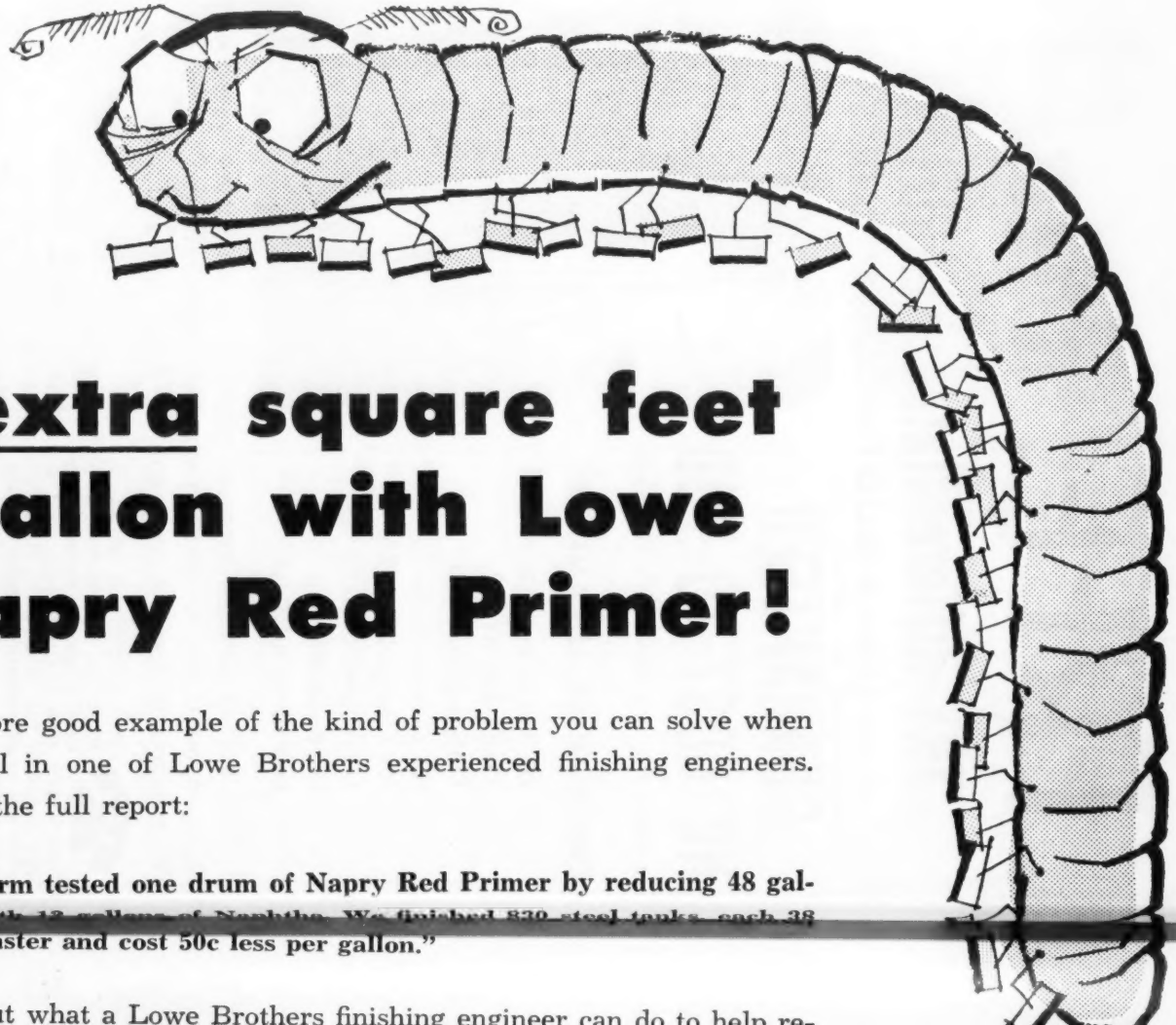

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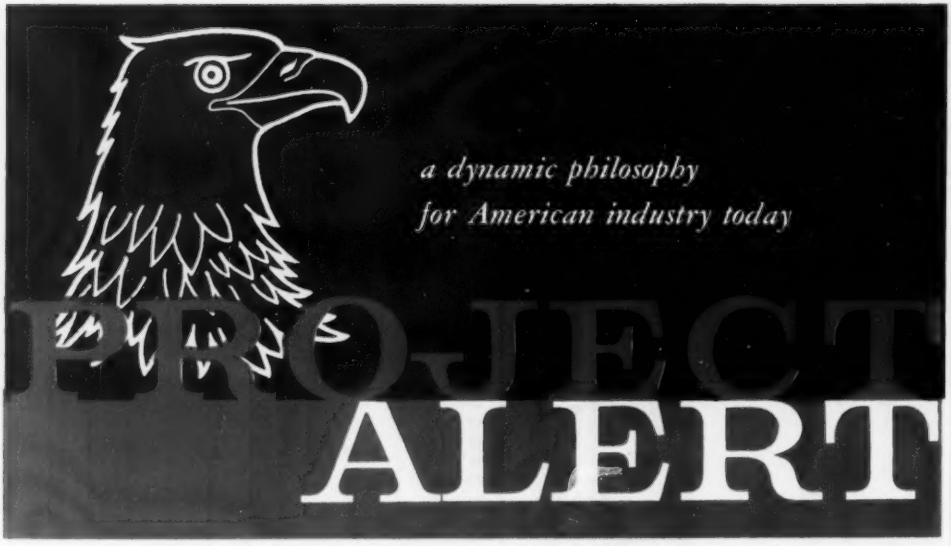

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1. **Observation:** This means inspiring your people to look at your problems with curiosity and creative imagination. It is taking a walk through your plant and looking at things as though you are looking at them for the first time. It is cutting through the fog of complacency and seeing things with new eyes. It is looking for new ways to stop leaks and losses; searching for new ways to speed production and efficiency.

2. **Concentration:** This means the intense application of the mind power of everyone to specific problems. It is the starting of new creative fires in your organization. It is having key people ask themselves key questions: How can I do my job better? How can I speed the flow of work? How can I cut down on errors? It is applying individual and group thinking to a list of things to be done and sticking with them until they are finished. It is preparing today to solve the problems of tomorrow.

3. **Devotion:** This represents a new vital spirit of rededication to your company, to your customers, to your industry, to America. It is a return to the creative ingenuity that made this nation great . . . finding a way or making one. It is having the power and purpose to go forward, to believe in the future to move ahead to better things.

We at Udylite believe in Project Alert. All of us, to a man are pledged to a policy of dynamic alertness in every facet of our jobs . . . in our contacts with fellow workers . . . in the handling of equipment . . . on the production line . . . in our contacts with suppliers and customers.

C. H. Reeme, *president*
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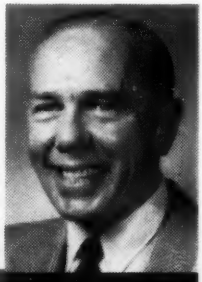

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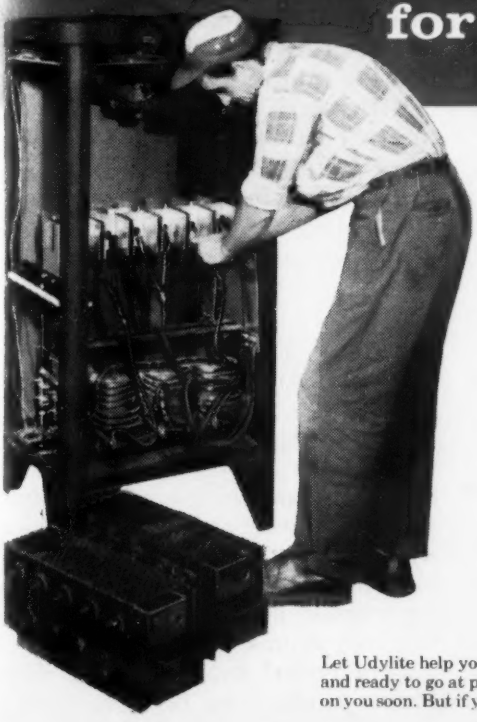
SILICON EFFICIENCY, RUGGEDNESS AND LONG LIFE

for old rectifiers



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PROJECT ALERT

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Plant-Wide Degreaser Solvent System

California manufacturer installs central storage tank, fills it with trichlorethylene to serve degreasing vats throughout the plant . . .

A new system for receiving, storing, handling, and final disposal of trichlorethylene degreasing solvent saves time and money and promotes safety for a California manufacturer. The system was designed and installed recently by the Plant Engineering Department of The Garrett Corporation's AiResearch Manufacturing Division, Los Angeles, Calif.

The heart of the new system is a 4000-gallon quarter-inch steel supply tank located above ground just outside the shop area. Incoming solvent is delivered to this tank then pumped to seven large degreasing vats in various parts of the plant. The centralized tank replaces many 55-gallon drums formerly used to store the solvent.

From the central supply tank a network of pipes some 900 feet in total length carry the solvent directly to the seven degreasers. Obvious safety advantages deriving from this method of distribution include (1) elimination of physical contact with the solvent fumes while emptying drums into cleaning units; (2) elimination of the physical exertion required to move the drums (weighing about 750 lbs. each when full) to the degreasing units; and (3) elimination of the hazards involved in chain-hoisting the drum in a steel harness, then tilting it for pouring into the vat.

AiResearch officials point out also that a considerable cost saving accrues from being able to purchase the solvent in bulk lots for the 4000-gallon tank instead of in 55-gallon drum lots. Bulk purchase also eliminates the deposits on the drums.

The new bulk-storage system also conserves solvent. When the solvent was stored in drums, condensation inside the drums (particularly after a rain) often caused internal drum rusting and contamination of the solvent. At other times, when degreasers were drained and cleaned, dirty sludge or degreasing fluid would inadvertently be placed in clean drums. When new solvent was delivered to the plant, these drums would often be among those set aside to receive it. When subsequently checked, the contaminated solvent had to be discarded. If by accident one of the contaminated drums found its way to the cleaning unit, the problem was compounded, since the entire cleaning vat had to

be re-cleaned, and this usually on overtime to avoid downtime while the shops were operating.

In the new system, the solvent is fed into the plant pipe lines by a ¾-h.p. "Model S Chempump" under 30 to 40 p.s.i. pressure. The pump is started by a pressure switch when line pressure drops below 20 p.s.i. In addition to a check valve in the line, a pressure-relief valve set at 50 p.s.i. was also installed. This valve was necessary to relieve pressure in gaseous form as temperature rises in the piping through the plant. When this pressure-relief valve operates, a feeder line carries the condensed solvent back into the main tank.

The cleaning vats now serviced by the outside central supply system are in the company's plating, turbine-assembly, extrusion, copper plating, spot welding, and aluminum-wash shops. At each vat, the solvent supply is controlled by a shut-off valve, and fed into the vat by a neoprene plastic hose. In the vat, it is heated to the vapor form required for degreasing. The parts cleaned cover the range of such items as tubes and sheet metal components for aircraft heat exchangers, pressurization turbines, etc.

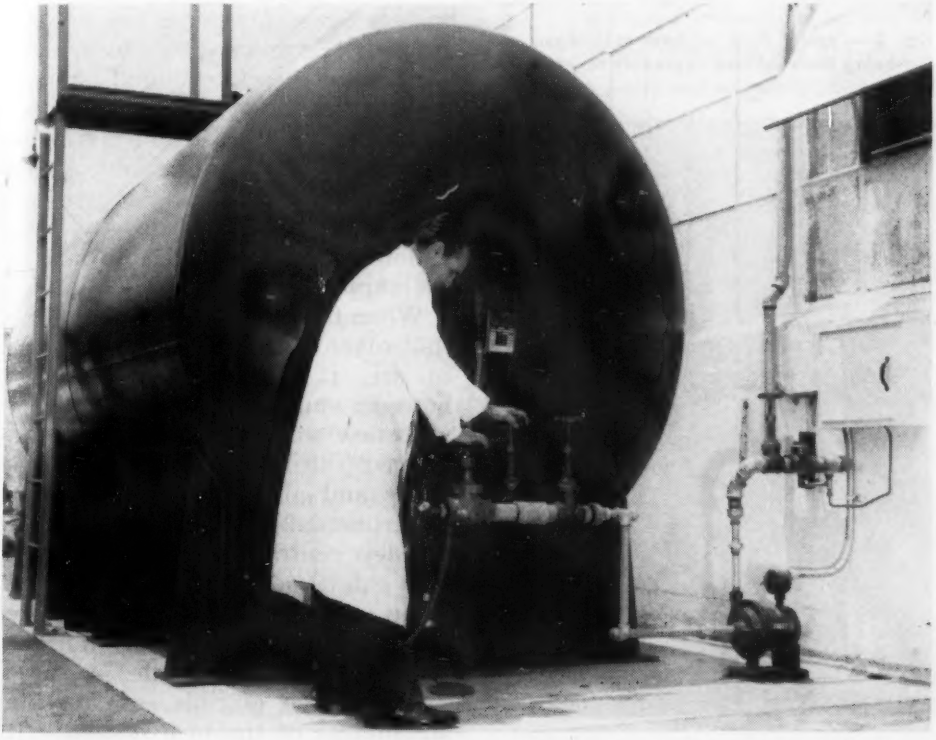

Fig. 1 — This 4000-gallon solvent-storage tank just outside the factory building takes the place of many drums. Valves open flow of solvent. Pump maintains solvent-distribution pressure in pipe lines which lead into building and to the seven degreasing vats.

Fig. 2—Typical load of heat-exchanger tubing being lowered into degreaser for cleaning.

Fig. 3—Spraying solvent on tubing. Line pressure from central-storage system is used to actuate spray. (Photos courtesy AiResearch Manufacturing Division of The Garrett Corp.)

". . . solvent can be added . . . with no interruption in work schedules."

Though the new system has sufficient capacity for expansion to more cleaning units, a few units are in portions of the plant where it is impractical to lay piping. The cleaning solvent for these units is withdrawn from an auxiliary outlet on the main tank and handled in the conventional manner.

After the solvent has been used and is ready to be discarded or returned to the supplier, a portable 50-gallon tank with a pump is used to remove and receive the solvent from the cleaning vats. The tank is then wheeled to an outside underground temporary storage tank and the solvent is drained into the latter through a simple outlet valve. From this underground tank, the used solvent is vacuum-drawn into an 800-gallon tank truck and returned to the supplier.

When the old method of handling the solvent in 55-gallon drums was in use, it required almost an hour to empty a tank, then fill it with new solvent. This was accomplished during normal working hours and always interferred with departmental work schedules. With the new central supply system, solvent can be added to any one of the seven widely scattered cleaning units at any time with no interruption of the work schedules.

AiResearch officials sum up the advantages of the new system: "It saves time, money, and promotes safety, and its installation cost was not excessive . . ."

tootsietoys

are painted by the millions with

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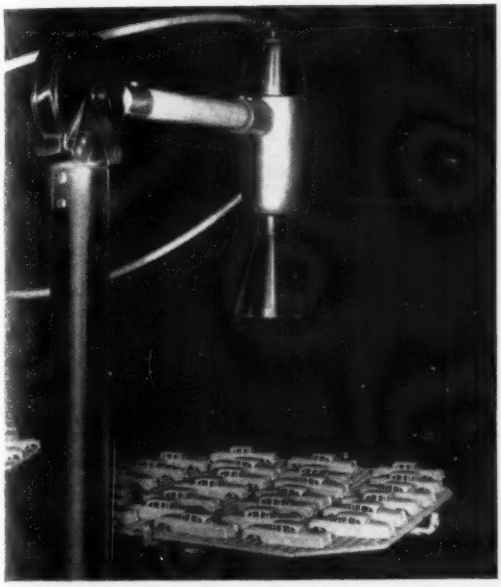

Miniature automobile bodies of the tootsietoy line are efficiently and uniformly painted as trays of cars pass below one of the four Ransburg No. 2 Process atomizing bells.

QUALITY OF THE FINISH IS IMPROVED AND PAINT COSTS ARE CUT 65% WITH *Electrostatic Spray Painting*

Dowst Manufacturing Co., Chicago, are sticklers for quality in the production of tootsietoys which are turned out at the rate of 25 million a year. That's one reason they changed from hand spray to Ransburg Electrostatic Spray Painting.

RESULTS? Rejects are cut from as much as 5% to about 1%, for they're getting a more uniform, higher quality coating on all parts. Colors are changed easily, and paint mileage is stepped up substantially. For instance, on one toy item, a gallon of paint coated only 1800 units by hand spray. Now, with Ransburg No. 2 Process, they paint 5500 pieces per gallon. That's because of the unmatched efficiency of Ransburg No. 2 Process.

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Finishing Industry Interviews

Part V in a series of interviews with prominent people in the finishing industry

Andre Waldberg: European Platers Are Improving Quality, Overcoming Many Obstacles

Mr. Waldberg, would you describe your company and its functions? What American companies do you represent?

Mr. Waldberg: I direct the Waldberg S.A., which means Waldberg Company, Ltd. We are located just outside Paris in Puteaux (Seine). We have been established since 1905. Besides manufacturing machinery such as automatic plating equipment, we represent the Hanson-Van Winkle-Munning Company, Matawan, New Jersey and also the Metal and Thermit people from New York for many of their solutions and finishes. We do not sell equipment of their manufacture in Europe on account of the difficulty we have with the import situation.

Do you cover only France in selling?

Mr. Waldberg: We cover France in selling the products of American companies. We sell our own products in France, and we also export to England, Belgium, Portugal, Italy and South America.

Do you design as well as manufacture your plating equipment?

Mr. Waldberg: All of the material we manufacture is of our own design. We have our own draftsmen, our own engineers and we design new machinery and equipment. We're getting specialized now in the plating field for the printing industry, and all the machinery and equipment we build are being conceived and engineered by us.

Does your equipment cover the entire field including barrel plating, automatic plating machines, and other products?

Mr. Waldberg: Yes, as a matter of fact, we're practically the only manufacturer of automatic machines in France. We have built 23 or 24 up to this time. We build barrel equipment and other products. We do not build rectifiers. We have one manufacturer build rectifiers to our own specifications.

Would you care to discuss the

European industries which have plating departments?

Mr. Waldberg: That's a large-size order, because many industries, producing motor cars, bicycles, sewing machines, stoves, plumbing supplies, and so on, do have plating departments. Many industries have set up plating plants for their own production to control the quality and because their rate of production had increased so much.

Would this indicate that the job plating industry in France, or in Europe, is not too sound, or that it does not do work of such good quality?

Mr. Waldberg: Some years ago, in many cases, it was poor, and customers complained. Since then they have improved the quality of their work considerably by expanding and modernizing their plants in order to meet the quality standards asked for by all their customers. They have switched to well-known solutions and their work now compares favorably with that in many other countries.

We understand that the British Industries Fair always has a substantial exhibit of plating equipment.

Mr. Waldberg: That's a yearly exhibit that they call the BIF. One part is in London and one part is in Birmingham. We have the same thing in France which we call the Foire de Paris. This fair opened about a week ago and is going on now, as a matter of fact. It opened the day I left for the United States to attend the Cincinnati A. E. S. Convention. As a matter of fact, I didn't have a chance to visit our stand. This fair has exhibits of everything mechanical—tools, glassware, everything that is manufactured in France.

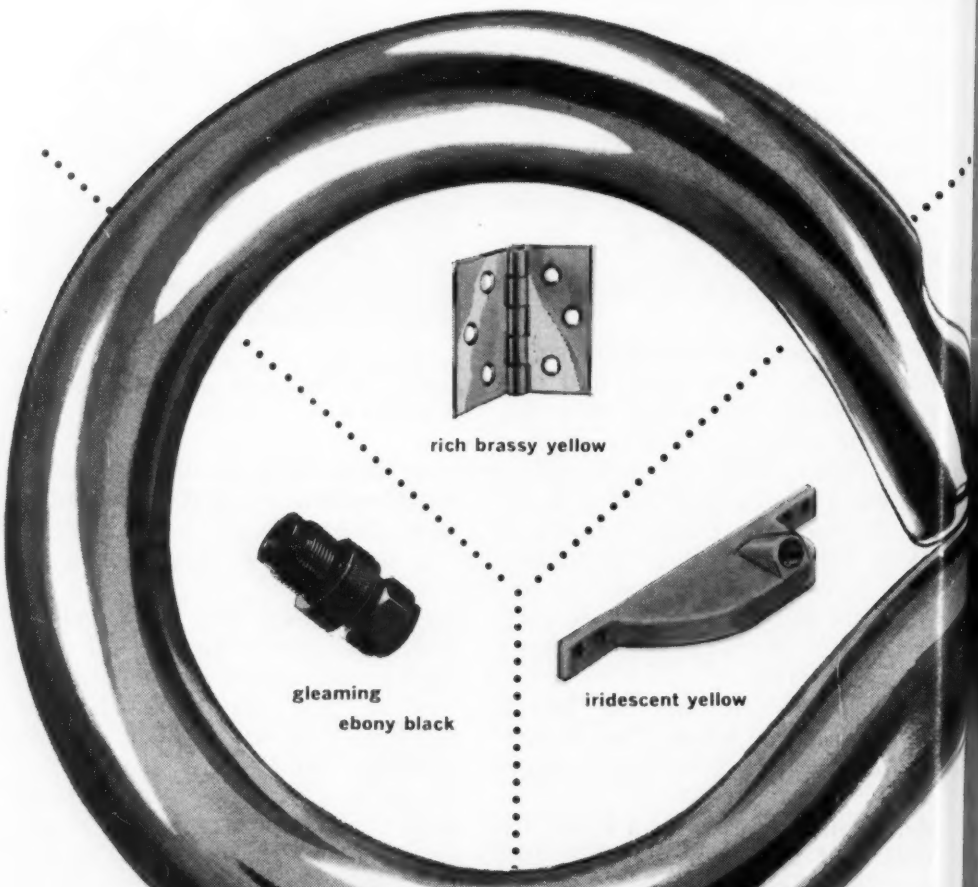
Andre Waldberg comments on European plating. Mr. Waldberg is Directeur General of Waldberg, S. A., Paris, France.

Is there an organized plating society in France?

Mr. Waldberg: No. We formed a syndicate about a year ago. I managed to get several of our competitors together, and we shall meet regularly and try to work out our problems which are numerous. There is also a very well known hard chrome society which is presided over by Mr. Morriset. He is a very able man who knows a lot about hard chrome. They distribute a monthly booklet which is quite interesting. As far as plating is concerned, I think the British are far ahead of us, because they have a meeting every year, similar to your convention. We haven't been up to that yet, but I hope it will start soon, and if it does, you are cordially invited to attend.

Result of chromate treating zinc in ***UNICHROME DI***

eye appeal c



Dyed coatings produce many colored finishes not shown here.

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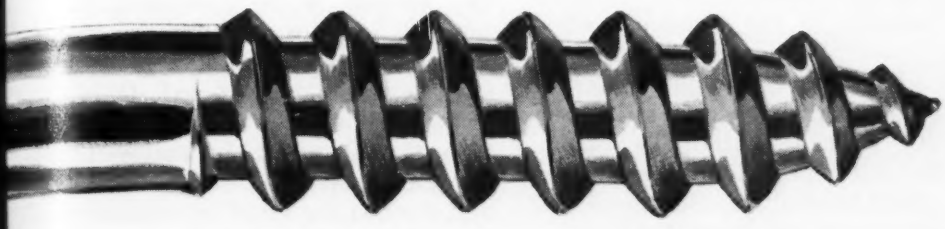

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Coatings Versus Corrosion

Corrosion Engineers' seminars consider organic and inorganic coatings, their properties and applications . . .

PRODUCTS FINISHING STAFF REPORT

The Third Annual North Central Regional Conference of the National Association of Corrosion Engineers included two symposia of interest to the finishing industry. About 200 corrosion engineers attended the Cincinnati meeting, held October 15-17, had the opportunity to hear authorities on organic and inorganic coatings speak on their specialties. Summaries of these papers are presented here.

Symposium on Organic Protective Coatings

Sylvan B. Falck, Inner-Tank Lining Corp., Cincinnati, Ohio, served as chairman of the Organic Protective Coatings Symposium and technical program chairman for the Conference.

Structural Design and Corrosion

C. G. Munger, vice president in charge of manufacture and research, Amercoat Corp., South Gate, California, stated that corrosion studies of structural surfaces have been directed toward learning the effects of chemical solutions and the atmosphere on steel, copper, and concrete protected by paint, zinc, vinyl or epoxy coatings, polyvinyl chloride sheet linings. These products provide protection to surfaces in accordance with the condition of the surface and properties of the coatings.

Consideration must be given to the surface to be covered, the methods used in applying the coatings, and the basic design of the structure to be protected. Only a proper combination of these three factors will result in satisfactory service. Properties of the surface and the coating must be considered. Mr. Munger stated that proper application is 90 per cent of the effectiveness of the coating.

"Improperly designed structures can nullify all good qualities secured in the coating and its proper application," he said. Sharp edges, angles and corners are hard to protect. These should be rounded. Details of design of steel structure difficult to coat were itemized.

The method of assembling structures has a bearing on protection. Rivets and welds present coating problems. Surface roughness and weld slag must be removed.

The points covered were illustrated by means of slides showing

typical problems. Structures must be designed with coating problems in mind. Pipe is a good structural material (cylindrical shape). It must be sprayed from 4 to 6 different angles to obtain overlapping coats, no thin areas, and good protection.

A Classification of Coatings According to Their Performance

Kenneth Tator, Kenneth Tator Associates, Coraopolis, Pennsylvania, explained a simplified method of choosing from coatings available today. Since there are some 2500 manufacturers of protective coatings in the United States, and since each of these companies has at least two products that you can use, you are faced with the impossible task of evaluating about 5,000 coatings to find which one or ones are best suited to your purpose.

The speaker said that there are some 20 generic, useful coating types. Basic properties are determined by the generic type. To simplify selection, Mr. Tator grouped the coatings as shown in Table I.

The classification is arranged so that lowest-cost materials are listed first. Cost increases, generally, as one reads down the list.

Resistance to heat and organic solvents is obtained from the coatings which are classified under: *A. Reactive.* Alkali resistance is to be expected from coatings under *B-2, -3, -4,* and *A-5, A-4b, -c.* Acid resistance increases as one reads down the chart on both sides (omitting sacrificial metal classification). Resistance to an oxidizing condition may be expected from coatings classified under *A-4, -5,* and *B-4.*

Practical Aspects of Protective Coafing Specifications

The paper was written by J. R. Allen, senior service engineer, and Gerard Mackey, specialist, Engineering Design Div., E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, and presented by Mr. Allen.

Table I

COATING CLASSIFICATION CHART

A. Reactive. React after application to develop full resistance to corrosion or abrasion.
1. Oil Derived
   a. straight oil
   b. alkyd
   c. phenolic-tung
   d. epoxy ester
2. Sacrificial Metal
   a. zinc rich
   b. aluminum rich
3. Silicones
4. Thermosetting (bake or catalyzed)
   a. phenolic
   b. epoxy
   c. furane
5. Vulcanizable Rubber
   a. Neoprene

B. Plastic. Reversibly thermoplastic. Resistance after application is not changed.
1. Wax and Grease
2. Bitumin
   a. asphalt
   b. coal tar
3. "Rubber-Base"
   a. butadiene-styrene
   b. chlorinated rubber
4. "Vinyl"
   a. chloracetate
   b. vinylidene chloride (Saran type)

The speaker stressed the importance of spelling out in detail the method of surface preparation, the finish, and the finish or paint application method. He outlined the various factors influencing the development of adequate specifications. He stressed that specifications should be drawn to secure the maximum protection consistent with sound economy, and presented examples to illustrate requirements and limitations in specifications. With these factors in mind, the specification can then be developed to include the surface preparation of the product to be coated, the coating system, and the application method. This should result in a brief job specification supported by reference specifications and standard engineering specifications.

Acid Brick and Corrosion Resistant Mortars in Chemical Construction and Maintenance

Thomas E. Ronay, The Richardson Co., Melrose Park, Illinois, considered the protection of steel tanks with combinations of organic tank linings and acid resistant brick and mortar to protect the tank against high temperature and acid attack. He covered in detail the use of reinforcing steel, the use of double layers of bricks with organic coatings between the layers, methods of construction, and details of the materials, their properties, and costs.

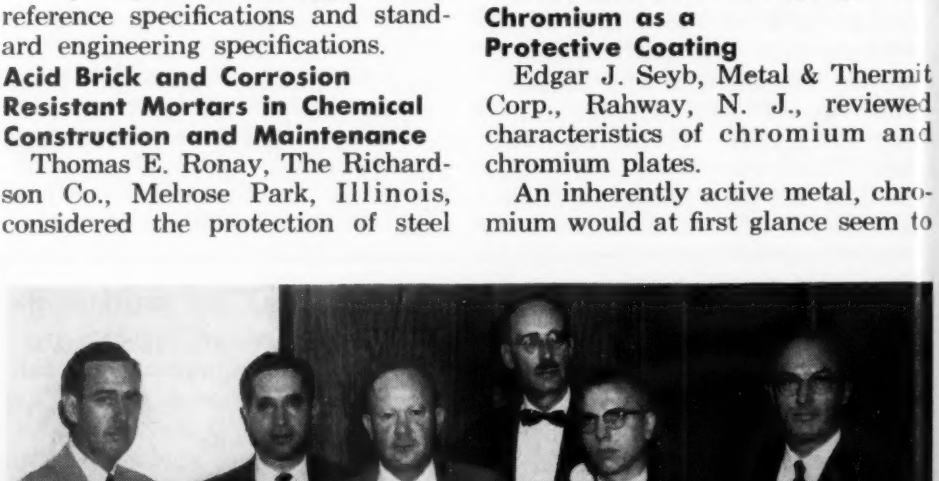
Symposium on Inorganic Protective Coatings

Authorities on inorganic protective coatings spoke on properties and applications of various types of coatings. Chairman of this symposium was William M. Spurgeon of General Electric Company.

Chromium as a Protective Coating

Edgar J. Seyb, Metal & Thermit Corp., Rahway, N. J., reviewed characteristics of chromium and chromium plates.

An inherently active metal, chromium would at first glance seem to



Chairman and speakers for the recent N.A.C.E. Symposium on Organic Protective Coatings. Shown (left to right) are: J. R. Allen, Sylvan B. Falck, Gerard Mackey, Kenneth Tator, Thomas E. Ronay, and C. G. Munger. (PRODUCTS FINISHING Staff Photographs)

be a poor protective coating Mr. Seyb commented. It ranks between iron and zinc in the Galvanic Series, is more active than tin or nickel. But because chromium rapidly forms an oxide film that is quite inert, it is valuable as a protective coating. Passivated chromium ranks between silver and platinum in the Galvanic Series.

In the commonly used protective coating formed by a chromium plate over a nickel plate, corrosion occurs by attack of the nickel through the chromium plate, since nickel is anodic in the combination. For basis metal protection it is best to have the anodic coating on the outside, but for appearance, this procedure is reversed—putting the chromium on the outside because it is brighter and non tarnishing.

Chromium's weakness as a corrosion protective in the past has been the network of cracks formed in the plate, which allows electrolytes to get through the film and attack the metals beneath. This situation has been improved by the advent of the "crack-free" chromium plate, which makes it possible to deposit a film free of the characteristic cracks. This plate has improved corrosion resistance substantially. In a regular salt spray test a 0.0003-inch deposit of ordinary chromium is badly corroded after 24 hours; a 0.0003-inch crack-free deposit is not as badly corroded after 175 hours in regular salt spray.

More recently *bright* crack-free chromium plating baths have been developed which make it possible to deposit a film four to five times thicker than previously possible and still be bright and crack free. Higher temperatures and special baths are required to do this, but corrosion resistance of steel plated in this manner is greatly improved.

Edgar J. Seyb

In speaking of applications for chromium plating, Mr. Seyb noted that most applications for chromium plates are based on the inertness of the passivated film, its high hardness and low coefficient of friction, its good resistance to many chemicals, and its excellent "release" properties.

Specific applications for chromium plates in addition to the well-known automotive bumpers and trim parts include drying cylinders for cheese, where chromium's excellent release properties are valuable; many applications in the chemical industry, where it is used for its good resistance to sulfur in making pumps, valves, cooling coils and other equipment; use in handling hot gases, where chromium is useful because it is unreactive and less likely to contaminate the gases; chromium is used in protecting molybdenum used in high-temperature applications (molybdenum would oxidize to the hexavalent oxide, melt and vaporize readily at high temperatures, while chromium oxidizes to the trivalent oxide and prevents further oxidation).

Mr. Seyb noted that high hardness is a characteristic of the electrodeposited chromium rather than

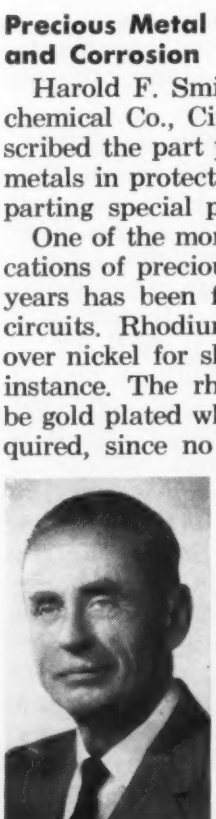
"It is important to dry the parts quickly . . . this helps to prevent tarnish."

a metallurgical characteristic of the metal itself. Chromium plates soften somewhat after heating, showing some evidence of softening at temperatures above 200 deg. C., and pronounced evidence of softening at 500 to 600 deg. C. But even after heating to 500 deg. C., the plate is very hard, in the neighborhood of 700 (Brinell), compared to an initial hardness of about 1000 Brinell before heat is applied.

Precious Metal Plating and Corrosion

Harold F. Smith, Smith Electrochemical Co., Cincinnati, Ohio, described the part played by precious metals in protecting metals and imparting special properties.

One of the more important applications of precious metals in recent years has been for plating printed circuits. Rhodium plates are used over nickel for sliding contacts, for instance. The rhodium often must be gold plated when soldering is required, since no flux is needed to solder gold, and this is important in critical applications. The soft gold soon wears away, but this is not important, since its purpose is served after the soldering operation is complete.



Harold F. Smith

The most commonly applied precious metal is silver. Silver is plated from a cyanide bath by the following cycle:

1. Clean
2. Rinse
3. Acid dip
4. Rinse
5. Silver strike
6. Silver plate
7. Cold-water rinse
8. Dip in acetic acid to neutralize cyanides
9. Rinse thoroughly
10. Dip in hot deionized water
11. Dry rapidly

In commenting upon this cycle Mr. Smith noted that it is important to make contact before immersion in the silver strike solution, so as to prevent depositing an immersion plate, which would have poor adhesion.

It is also important to dry the parts quickly after the final rinse, Mr. Smith said, since this helps to prevent tarnish. Quick drying is especially important if the basis metal is a ferrous metal, since the silver-iron galvanic cell has a voltage of 0.934 volt, and this is high enough to cause rapid corrosion if the parts are left wet for any length of time. One way to prevent this from happening is to plate the iron with zinc, then copper, then silver. In this way, the zinc provides galvanic protection for the iron.

In the case of silver plated over nickel, the galvanic cell voltage of the nickel-silver cell is even higher than silver-iron, but this is not too important, since nickel is not eas-

ily oxidized, and therefore rusting is not a serious problem.

Silver plated over brass produces a galvanic cell with a small potential difference, not enough to cause rapid corrosion.

In reference to silver sulfide, or "tarnish," Mr. Smith noted that the black film formed is ugly, but in some cases is unimportant. This is true on utilitarian silver plates, where silver is plated for its electrical contact properties. Silver sulfide causes no difficulties in this case. In applications where the sulfide is a problem, sulfide-absorbing paper is used in storing the silver-plated parts.

Gold plates are used for their combination of low contact resistance and resistance to oxidation, Mr. Smith said, especially in critical applications such as missiles, where specifications are very exacting. While gold plates give excellent protection from corrosion, they are so expensive that their use for this purpose is limited. It is interesting to note, however, that ball burnished gold plates have measurably increased corrosion resistance, and "phenomenal results" can be obtained by this method, Mr. Smith noted.

Gold alloy plates are available with twice the hardness of pure gold. Gold plated with periodic reverse current is brighter than if deposited with current flowing in one direction only.

Gold plated over ferrous metals produces a potential difference of 1.55 volts, enough to cause serious corrosion, especially in low-current-density areas where the plate is thinner. This difficulty can be avoided in the same manner used to avoid the corrosion cell in silver plating —a zinc-plated undercoat.

Platinum and rhodium plates have certain specialized uses, but are limited by cost considerations, since both are very expensive — $17.10 per square foot for a 0.0001-inch-thick coating in the case of platinum.

Electroplated Alloy Coatings

Dr. Charles L. Faust of Battelle Memorial Institute, Columbus, Ohio, reported on alloy plates — those formed by two or more metals that are electrodeposited simultaneously or diffused by heat treatment.

Great strides have been made since 1940, the 100th anniversary of alloy plates, Dr. Faust said. At that time alloy plates were little used, and those that were applied were primarily for decorative purposes.

Dr. Charles L. Faust

Coatings developed since that time have improved rapidly. In some cases, properties of the alloy coating surpass properties of either metal in the alloy.

Primary reason for the development of alloy coatings, commented Dr. Faust, has been to obtain coatings with properties that cannot be obtained in any other way. Alloy plates are sometimes deposited to produce a coating with a finer grain size than plates of either of the metals used to make up the coating; some alloy plates are harder than either of the metals in the

"Best basis for alloy plates . . . is an electropolished surface."

combination; some alloy plates have less porosity than either metal in the combination; alloy plates are often deposited to obtain a coating with the desirable properties of both metals.

It is interesting to note that alloy plates have different properties than their non-electrolytic counterparts.

In discussing specific properties of alloy plates, Dr. Faust described corrosion test results for a number of alloy plates tested at moderate temperatures under atmospheric conditions — moisture, salt spray, and so on. Tests have shown that bronze plates protect steel better than either copper or tin. The same is true of a tin-zinc alloy: it protects steel better than either a tin or zinc plate of the same thickness. In comparing copper and bronze in salt spray tests, the superior protection given by bronze is obvious. A tin-zinc alloy gives better protection in hot-water tests than a galvanized coating of the same thickness.

Dr. Faust noted that laboratory test results often cannot be correlated with service experience. In the case of white bronze plates over zinc die castings, failure occurs overnight in a salt spray cabinet, while a nickel plate of the same thickness will pass 100 hours of the same test. Yet in actual service on automobile bumpers the same white bronze will outlast the nickel, he said. Similar variation in results exists when trying to correlate results from different accelerated tests, such as Corrodkote versus salt spray, Dr. Faust noted.

To obtain best results from alloy coatings, said Dr. Faust, the user must first know what qualities he is trying to produce and then control conditions to attain these properties. It is very important to control conditions of deposition, Dr. Faust noted, since wide variation in properties results from variation in conditions of deposition.

Alloy coatings are practical to control, can be so carefully controlled that in the case of a lead-tin-copper alloy plate, deposition is precise enough that no post-plate machining is necessary.

Basis metal preparation is also extremely important, especially for critical applications, such as high-temperature uses. In addition to the usual care required in cleaning before plating, method of surface preparation is important in attaining good alloy deposits. Mechanical preparation with abrasives, while leaving a surface that is apparently smooth, actually leaves a surface with tiny loose chips and damaged metal that can be seen only by microscopic examination. Buffing to a mirror finish leaves a surface with intensive "tearing." Best basis found for alloy plates, Dr. Faust said, is an electropolished surface.

Taking a look at the future for electrodeposited alloys, Dr. Faust said that possibilities for alloy plates have been barely scratched, and that

research on alloy coatings has greater potential for producing significant results than research on single-metal systems.

Ceramic Coatings Versus Metal Corrosion

W. J. Plankenhorn, Chicago Vitreous Corporation, Chicago, Ill., spoke on properties of ceramic coatings, emphasizing coatings used primarily for protection.

Mr. Plankenhorn briefly reviewed the composition and application procedures for ceramic coatings.

Basic material for ceramic coatings is glass, he explained. By quenching molten glass rapidly, a material called frit is produced. This frit is wet milled in ball mills to produce a fine suspension called slip. Additives and modifiers are used to obtain various properties.

The coating is applied by spray or dip, dried in an oven, then fired in a furnace at temperatures of 1100-2400 deg. F.

Ceramic coatings are applied primarily to protect metals from corrosion. A wide range of properties can be attained by using the proper additives and modifiers; therefore ceramic coatings are usually custom-formulated for a specific application.

Adherence of ceramic coatings depends largely on the interfacial oxide layer formed during firing—a useful instance of corrosion, Mr. Plankenhorn commented.

Ceramic coatings have other useful properties aside from corrosion protective functions. They are hard and rigid—so rigid that they can improve the rigidity of metals when applied in heavier coatings. Appearance can be varied from that of a black body to white opaque. Ceramic coatings will suppress radiation in certain wavelengths. Ceramic coatings are non-conductors in most cases, but electrical conductivity can be obtained if necessary.

W. J. Plankenhorn

They have thermal stability up to the temperature at which the glass begins to soften. They prevent heat corrosion, carburizing and intergranular oxidation. They have good thermal shock properties. The high-refractory coatings are good insulators. Ceramic coatings resist many chemicals, including alkalies below 120 deg. F. Corrosion-resistant ceramic coatings are often used as tank linings. Silica-free ceramic coatings resist even hydrofluoric acid.

Ceramic coatings have been used to extend the life of flux pots to more than 250 hours. They extend the life of radiant tubes in heat-treating furnaces. "Spall coatings" prevent oxidation of surfaces of parts being heat treated. After heat treating is completed, these coatings spall simultaneously, leaving a bright, oxide-free surface.

Flame Plating

J. F. Pelton of Linde Company, Div. of Union Carbide Corp., Indianapolis, Indiana, described the flame plating process and some of its applications.

Although flame-plated coatings have been used primarily for their

"The coating particles flatten out when they hit the surface . . ."

good wear resistance, Mr. Pelton explained, they are being explored as corrosion protective coatings.

Equipment for applying flame-plated coatings consists primarily of a detonation gun and a coating powder such as silicon carbide and cobalt with a carrier gas (usually acetylene plus oxygen). This mixture is ignited by a spark plug, travels through the barrel of the gun, gaining speed, emerges from the gun at 2400 feet per second, practically as an intact cylinder of powder particles contained in the hot gases. The powder particles are carried in the gas until they hit the surface being coated.

The coating particles flatten out when they hit the surface, form a metallurgical bond with the metal, on a molecular scale. No diffusion layer is formed with the base metal, at least not one that can be seen under magnification.

The work is cooled by a stream of carbon dioxide while being coated. Normally the temperature is kept below 300 deg. F., but it can be lowered to room temperature if desired.

Since the process creates so much noise it is carried out in a heavy cubicle by remote control.

Typical uses for the process include seal rings for jet engines; wearing surfaces; piston rings; rocket nozzles.

Pure tungsten coatings can be applied by flame plating. Aluminum oxide coatings have many pores, offer little corrosion resistance. Most coatings now used are notable for their wear resistance rather than corrosion resistance.

Tungsten carbide coatings with chromium, nickel and cobalt added have somewhat better corrosion resistance. Work is being done on coatings for molybdenum. Nichrome 5 coatings and alumina and metal coatings show promise.

Future work on flame plated coatings will center about developing coatings for use at high temperatures and for better corrosion resistance.

Further information concerning the papers presented may be obtained from the authors or from T. J. Hull, executive secretary, National Association of Corrosion Engineers, 1061 M & M Bldg., Houston, Texas.

★ ★ ★

Barrel Finishing Compounds. Compounds designed for deburring, burnishing, and descaling metals in barrel operations are the subject of an eight-page booklet available from Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

A thorough treatise on the nature and uses of barrel finishing, the booklet points up the necessity for the right combination of media, solution, speed, and loading. It tells how to preclean parts, how to select media for specific metals, shapes and sizes of parts, operations to be performed, and finishes desired. Compounds discussed include alkaline and acidic, abrasive and non-abrasive, each designed for specific operations.

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Vacuum Deposited Coatings Today

A report on the 1958 Technical Conference of the Society of Vacuum Coaters

PRODUCTS FINISHING STAFF REPORT

"Some 500 vacuum metallizing units are now in production," stated T. J. LaBounty, president of the Society of Vacuum Coaters, in opening the society's 1958 Technical Conference (Fig. 1). Although some vacuum evaporation was done in the 1930's, this finishing process has now grown (particularly since 1950) to assume the proportions of a major industry.

Fig. 1—T. J. LaBounty, Midwest Technical Sales and Service, Downers Grove, Illinois, president of the Society of Vacuum Coaters, opened the society's 1958 Technical Conference, held November 6 in Detroit, Michigan.

Maintenance Problems in Vacuum Coating Systems

J. P. MacNeil, NRC Equipment Corp., Newton, Mass., discussed the establishment of routine maintenance procedures for keeping vacuum coating units operating properly. He pointed out that the operator must accept the fact that a vacuum metallizing unit is quite different in design and operation from other equipment with which he may be more familiar. The operator must understand what is happening in his unit in order to maintain it.

Mr. MacNeil (Fig. 2) discussed the system as a whole, and then covered various parts of the system in detail from the standpoint of proper maintenance: mechanical pumps, diffusion pumps, and gages.

Stressing the urgent need for operator education, Mr. MacNeil cited several considerations with regard to proper operation of diffusion pumps. Silicone oils are considered to be best for use in diffusion pumps.

The average operator can make only simple repairs on vacuum gages. Mr. MacNeil recommended that gages and controls be returned to the manufacturer for repair.

Maintenance of the vacuum coater proper includes inspection of seat gaskets to be sure that the seal is perfect, lubrication of valves, regular cleaning of jigs and fixtures, and regular cleaning of the coater or tank interior.

To assist each operator in learning more about his unit so that he can operate it and maintain it more effectively, it is desirable, when a new unit is installed, to make a record of the cycle time and blank-off ability for each component in the system. The operator can use this information as a guide to check his daily operation against the "standard." This comparison provides an immediate indication of possible sources of operating difficulties.

Long cycles reduce the efficiency of vacuum coaters. Such contaminants as aluminum, plastics and lacquer in the coater interior absorb water vapor and add a substantial load to the pumping system. Humid weather makes the problem worse. To determine whether pumps are operating improperly, or if the unit merely requires cleaning, a series of test cycles should be run at no load. The time cycles necessary to pump down to prescribed vacuum conditions can be noted. If a much faster cycle is obtained on the second test, then pumps are operating properly, and cleaning of the unit or further check for leaks is indicated.

Color Decoration by Spraying with Masking Tools

Hamilton E. MacArthur, president of Conforming Matrix Corp., Toledo, Ohio, spoke briefly about the use of color and color decoration in final finishing of consumer prod-

Fig. 2—J. P. MacNeil spoke on Maintenance Problems. Milton Z. Thorson (seated at right), vice president of Red Spot Paint & Varnish Co., served as moderator at the first session.

"Glow-discharge cleaning may serve as the final cleaning . . ."

ucts. "Color is the keynote of consumer sales," he stated. Mr. MacArthur (Fig. 3) then presented a sound and color movie showing the operation of several types of spray painting machines employing masks to achieve efficient, rapid decoration of a wide variety of products.

Glow Discharge Cleaning

John Smith, technical service engineer, Consolidated Electrodynamics Corp., Rochester Div., Rochester, New York, described the equipment and procedure required to clean the work to be vacuum coated by glow discharge (Fig. 4). The cleaning is accomplished by the imposition (in a vacuum) of a very high voltage between the work and an electrode.

The following theories have been proposed to explain what happens in glow-discharge cleaning:

1. Ion-bombardment releases energy at the work surface and this removes contaminants and expedites the release of gas from the surface.

2. Ionization of residual gases in the chamber may result in chemical reactions between the gases and surface contaminants, resulting in some cleaning action.

3. Metal or metal oxide coatings sputter from the glow discharge anode and form extremely thin films on the surface to be cleaned. These residual films present a clean, new surface to which evaporated materials adhere well.

Glow discharge cleaning may serve as the final cleaning preparatory to the deposition of the metal film by vacuum coating. The glow discharge cleaning process may be used prior to coating of plastics for optical uses, with reflecting metal coatings, semi-transmitting coatings, or multi-layer coatings. It can be used also on metals which are to be metallized without a

Fig. 3—Hamilton E. MacArthur, president of the Conforming Matrix Corporation, presented a color movie entitled "Spray Painting and Decorating with the Aid of Masking Tools."

Fig. 4—John Smith, Rochester Div., Consolidated Electrodynamics Corporation, Rochester, New York, described glow discharge cleaning.

base lacquer coat. Glow discharge cleaning helps to remove absorbed gases from the vacuum chamber and to decrease the time for pump-down.

The high voltage required (5,000 volts at 500 milliamperes) may be either a.c. or d.c.

An Analytical Method of Leak Determination in High Vacuum Systems

Stating that his paper was, in many ways, a continuation or extension of Mr. MacNeil's paper on Maintenance Problems, A. Schlafmitz, vice president, Vacuum Metallizing Corp., discussed leak detection in a vacuum coating unit.

Indications of leaks are noted when there is a *gradual* increase in the pump-down time, or a *sudden* loss of vacuum in part or all of the system. In analyzing the operation to locate the area of the leak, an operator can study the apparent conditions based on what he can see and what he can hear. He can compare his operation to the standard operation of the new unit as recorded in chart form.

The sources of trouble that are hidden, while difficult to determine, lend themselves to detection by a scientific process of elimination.

Selection of Oven Equipment for Vacuum Coaters

Herman C. Gehnrich, engineer, Gehnrich & Gehnrich, Inc., Woodside, New York, discussed the design and operating cost of ovens for vacuum coaters (Fig. 5). He compared ovens using steam, electricity, or gas as the source of heat. Temperature requirements for various kinds of base materials or substrates as well as lacquer or paint coatings were discussed. These considerations influence oven design and choice of fuel in some cases.

Commenting on the need for cleanliness in the entire vacuum

Fig. 5 — Herman C. Gehnrich, Gehnrich & Gehnrich, Inc., discussed ovens for vacuum coaters, compared heat sources for ovens. Frank E. Miller, Jr., (seated at right), Owens-Illinois Glass Co., Toledo, Ohio, served as moderator for the second technical session.

". . . production of uniform films requires precise planning and techniques."

coating shop, Mr. Gehnrich stated, "An oven does not manufacture dirt —it merely circulates the shop dirt already present in the plant air."

Functional Coatings— Techniques of Reproduction, Monitoring, and Evaporation

Dave Baum, Vacuum Equipment Div., New York Air Brake Co., Camden, New Jersey, discussed the preparation of optical mirrors or lenses of various kinds through vacuum metallizing techniques (Fig. 6). He discussed in detail monitoring, quality control, inspection, or testing methods used to check coating thickness and uniformity. He also discussed methods through which a film of uniform thickness could be produced. Both optical and electrical test methods were covered.

Temperature measurements are also used to control thickness. Temperatures of work surface and source must be measured and controlled.

Problems in connection with reproducible coatings were discussed, among them work and chamber cleanliness, and coating techniques employed. Some alloy evaporants decompose so that the film deposited varies from the original coating material.

Mr. Baum stressed that production of uniform films requires precise planning and techniques. He showed slides to indicate how large mirrors are coated successfully.

In concluding, Mr. Baum said, "Monitoring evaporation techniques varies with the many applications of vacuum deposited coatings. The application of some of the more precise control methods may prove to

Fig. 6—Dave Baum, Vacuum Equipment Div., New York Air Brake Co., covered functional coatings and particularly techniques of evaporation, inspection and quality control.

Fig. 7—M. B. Gilbert, F. J. Stokes Corp., discussed progress in the vacuum coating industry and outlined trends indicating greater growth for the future of the industry.

be a source of savings in operating costs through extended filament life and more efficient use of evaporants. Coatings which today are laboratory curiosities may be tomorrow's bread and butter vacuum coating work."

Dip Dyeing of Finishes for Vacuum Metallizing

Robert J. Perkel, president of Jema-American, Inc., Newark, New Jersey, discussed advantages, problems, and use of the dip dyeing process. Stating that a colored top coat over vacuum metallized articles is the finish in greatest demand today, he estimated that 80 to 90 per cent of such decorative coatings are secured by dyeing (Fig. 9).

One way to color metallized products is to incorporate a dye or a transparent pigment into the top coat. This method is being used for finishing small parts that require deep shades of color. There are problems in securing uniform colors by this method, and dip dyeing is employed successfully in producing the desired shades.

The dyeing process is employed following the application of a transparent top coat over the vacuum metallized part. Parts are dipped in the dye solution to obtain the desired color. Mr. Perkel described characteristics of dyes and solvents, other variables in the process.

At the present time, dyes available cannot be recommended for use on products which must withstand continuous outdoor exposure. However, dyestuffs for coatings to be used indoors with intermittent exterior exposure are currently available. Light fastness of dyes can be prolonged by overcoating with special clear top coats.

The coatings to be dyed affect the choice of dye. Coatings which can be used successfully with the desired dyes and the required conditions of application and cure must be selected. Mr. Perkel discussed testing of dip dye solutions, causes and cures for water spotting, and general instructions for use of dip dyes in metallizing.

New Trends in Vacuum Metallizing

Vacuum metallized coatings are not just for viewing under glass, according to M. B. Gilbert, vacuum deposition equipment specialist from Philadelphia's F. J. Stokes Corporation (Fig. 7).

Present-day vacuum coatings are used for tough service in a variety of applications that would once have been "out of range." Steel protected by vacuum-deposited cadmium, for example, can pass Federal Specifications for aircraft: corrosion resistance, adhesion and uniform thick-

Fig. 8—J. Scharnberg, Bee Chemical Co., reported the results of tests made on finishes for vacuum metallizers and listed several important finish specifications for metallizing.

ness. Other vacuum coatings for steel will withstand temperatures up to 150 deg. F. and salt spray exposure up to 100 hours. "Many of today's coatings offer protection comparable to electrodeposited films of comparable thickness," Mr. Gilbert said.

Metallized coatings with excellent light and heat reflectance are being applied. And unusual decorative effects are being produced by using wrinkle finishes with vacuum metallized films.

The automotive industry has become a good customer for vacuum metallized products. Ford has used first-surface* vacuum coated interior trim pieces for the past three years. Second-surface coated parts now in common use by the auto makers include horn buttons, instrument dials, hub-cap medallions and

*Note: The term *first-surface vacuum coating* is used to describe films on the exterior surface of the part. *Second-surface vacuum metallizing* denotes films applied on a surface not exposed to wear — a metallized film applied on the under side of a transparent plastic so that it can be seen through the plastic, for example.

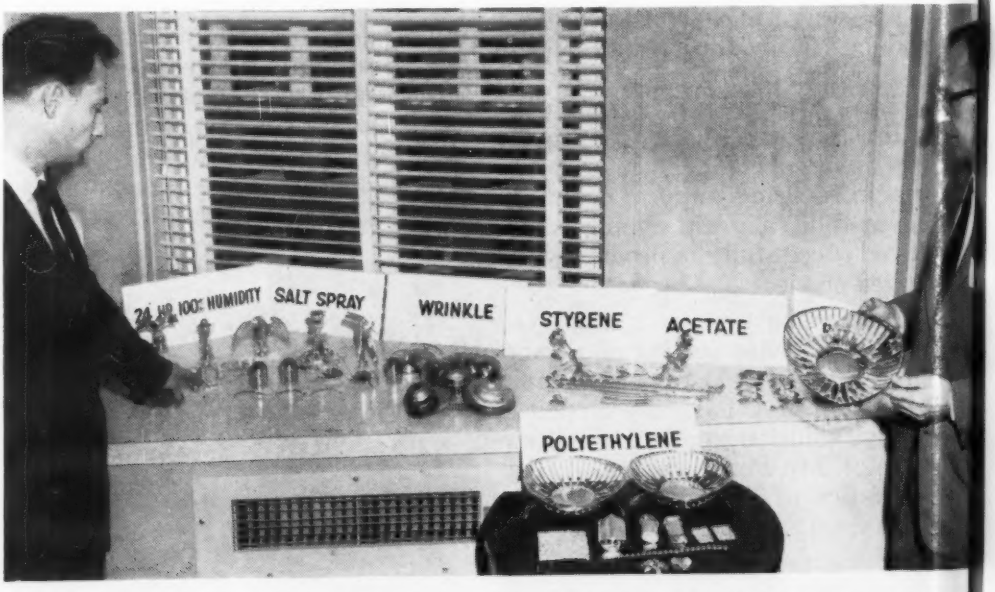

Fig. 9—Robert J. Perkel (left) points to a portion of the display of vacuum coated and dip dyed parts arranged by Jema-American, Inc. These parts illustrate the results that can be achieved through the use of dip dyeing, and serve as examples of some of the points made by Mr. Perkel in his paper. The parts shown are production steel, zinc base die cast, and brass parts which have received a base lacquer coat, a metallic coat of aluminum, and a top lacquer coat, after which they have been dip dyed in various shades. The lamp parts shown are steel parts finished in a wrinkle finish, vacuum coated with aluminum, top coated, and dip dyed. As the signs indicate, some of the parts are plastic pieces which have been finished by vacuum coating. Richard Parmalee (right), sales director for Jema-American, Incorporated, holds a polyethylene plastic vacuum coated product.

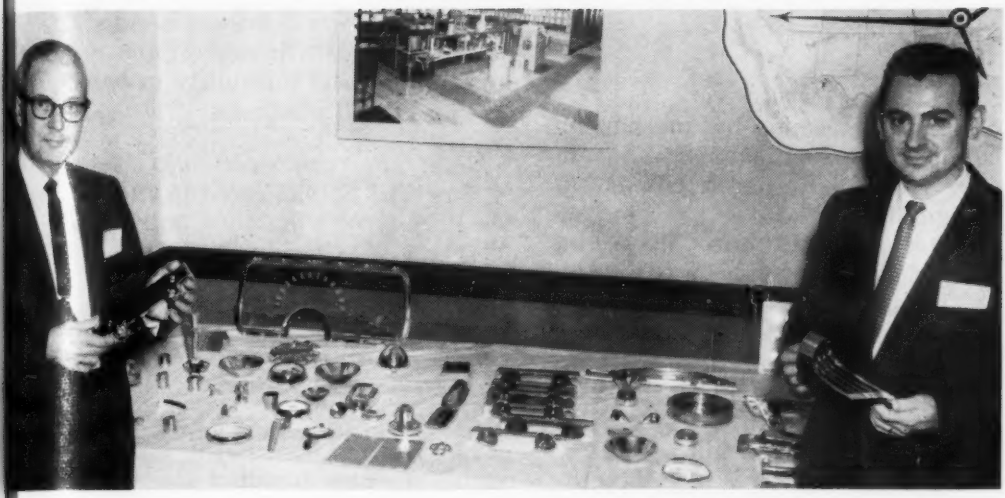

Fig. 10—Shown beside a portion of their display of first-surface vacuum coated parts are Dr. Lee B. Storms (left), director of research, and Morgan Jones, manager of first-surface metallizing applications, Red Spot Paint & Varnish, Inc., Evansville, Indiana.

arm-rest extensions. Many of these parts are metallized plastic, taking the place of polished and plated die castings.

Detroit began its switch to vacuum coatings in 1952, bought 10 development and production-size coaters for applying second-surface coatings in the five years that followed. In 1957, improved plastics and synthetic finishes prompted auto makers to make an important shift from second to first-surface usage. Two more metallizing units have been sold to automobile producers since that time.

Custom decorators who specialize in automotive trim parts have also shared in the metallizing boom, accounting for sales of seven large production-size machines.

Appliance manufacturers are taking a look at metallizing, too, increasing their use of metallized trim.

The electronics industry is using vacuum metallized coatings for functional purposes. These coatings are used on parts for resistors, capacitors, transistors and potentiometers.

Tomorrow's lighting may come from glowing glass panels made possible in part by vacuum metallizing.

New Coating Developments for Vacuum Metallizing

J. Scharnberg, research and development engineer, Bee Chemical Co., Chicago, Illinois, reviewed physical durability of metallized parts and specifications for vacuum metallized coatings (Fig. 8).

General studies conducted on metallized steel subjected to salt spray, and colorants exposed under Florida sun and in the Atlas Fadeometer were reported. Requirements for coatings for various uses were reviewed and the corresponding specifications and tests discussed.

Studies were conducted to at-

tempt to determine the mechanism of failure of metallized coatings on steel panels. It is anticipated that phosphatizing the steel prior to vacuum coating will bring about increased salt spray resistance.

The necessity for applying the coating in a dust-free atmosphere was again emphasized, since tests have proven that failures in coatings under salt spray are caused by dust particles in the film.

Equal emphasis was placed on the requirement for applying base and top coats in such a way as to assure the formation of continuous films free of air bubbles. Oven temperatures must be carefully controlled to secure sound coatings.

Mr. Scharnberg stated that the testing program would be continued and reported in detail at a future meeting along with suggestions for obtaining greater durability in coatings for metallized parts.

Note: The papers reviewed briefly here will be published in full by the Society of Vacuum Coaters, P. O. Box 3095, Cleveland 17, Ohio.

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For more information on any product advertised in this issue, use postpaid Reader Service Cards inside back cover.

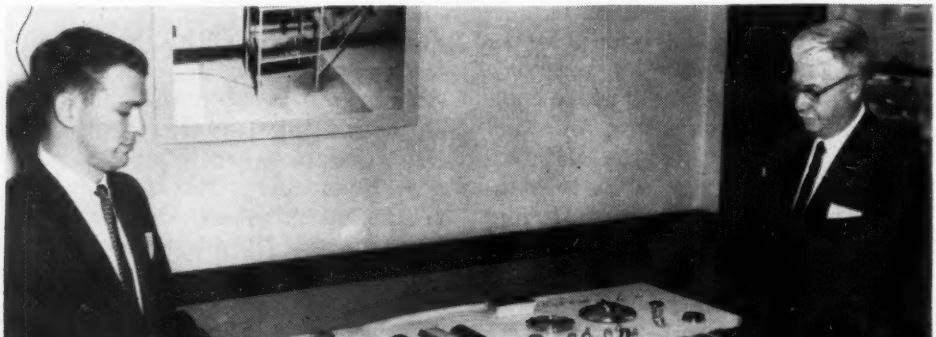


Fig. 11—Shown beside the Red Spot Paint & Varnish display of vacuum coated textured steel samples and plastic parts are O. Gene Nixon (left) service engineer, and Milton Z. Thorson, vice president of the company. (PRODUCTS FINISHING Staff Photographs.)

Deadline News . . .

NEW OVEN HEATER...

An indirect-firing system for heating ovens where products of combustion are undesirable has been developed by R. C. Mahon Company. System has "unique manifolding," plus different means of handling large volumes of recirculated air. Mahon engineers believe the system will be particularly useful in heating paint-baking ovens.

"PACKAGED" WASTE DISPOSAL...

An inexpensive waste-disposal system for treating cyanide wastes, recently introduced by George L. Nankervis Company, includes tanks, pumps, controls, "uniquely designed baffle tank" where wastes are neutralized by concentrated hypochlorite solution. Effluent can be dumped into city sewer, Nankervis says.

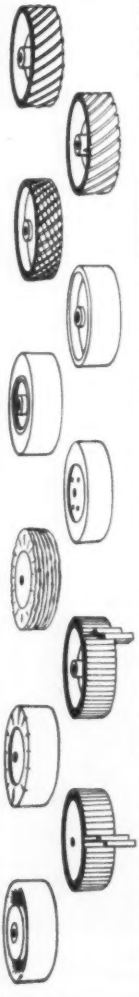
STRAP ON A PAINT HEATER...

A paint heater that a man can carry around on his hip has been announced by Spee-Flo Company. Lightweight electrically heated unit designated Model 300 B2 can be used for heating paint used in spraying large areas, structural steel, and for maintenance painting.

METALLURGISTS'S CRYSTAL BALL...

Space travel and peaceful use of atomic energy will require new materials and new combinations of old materials to withstand heat, corrosion, radiation, says Dr. Albert R. Kaufmann, vice president and technical director of Nuclear Metals, Inc. "Composite materials" may be one answer to some of the problems. These materials would consist of several layers—one layer would serve as a protective coating, another would be for strength at high temperatures, a third for strength at low temperatures, and so on. Graphite might form base for such a composite, Dr Kaufmann says. It lacks strength and ductility at low temperatures, but is strong above 3000 deg. F. Thus if it could be combined with material that would provide low temperature strength and another material that would protect it from oxidation, graphite would be useful in many high-temperature applications.

Contact Wheels: Types and Applications



SURFACE	MATERIAL	HARDNESS AND DENSITY	PURPOSES
Cog-tooth	Rubber	70-90 Durometer	Roughing
Standard serrated	Rubber	40-50 Durometer medium density	Roughing
X-shaped serrations	Rubber	20-50 Durometer	Roughing and
Plain face	Rubber	20-70 Durometer	Roughing and
Flat flexible	Compressed canvas	About nine densities going from very hard to very soft	Roughing and
Flat flexible	Solid sectional canvas	Soft, medium and hard	Polishing
Flat flexible	Buff section canvas	Soft	Contour
Flat flexible	Sponge rubber inserts	5-10 Durometer Soft	Polishing
Flexible	Fingers of canvas attached to hub	Soft	Polishing
Flat flexible	Rubber segments	Varies in hardness	Roughing and
Flat flexible	Inflated rubber	Air pressure controls hardness	Roughing and

Because conditions in shops vary, the data in t

Reprinted from Abrasive Tech, *published by th*

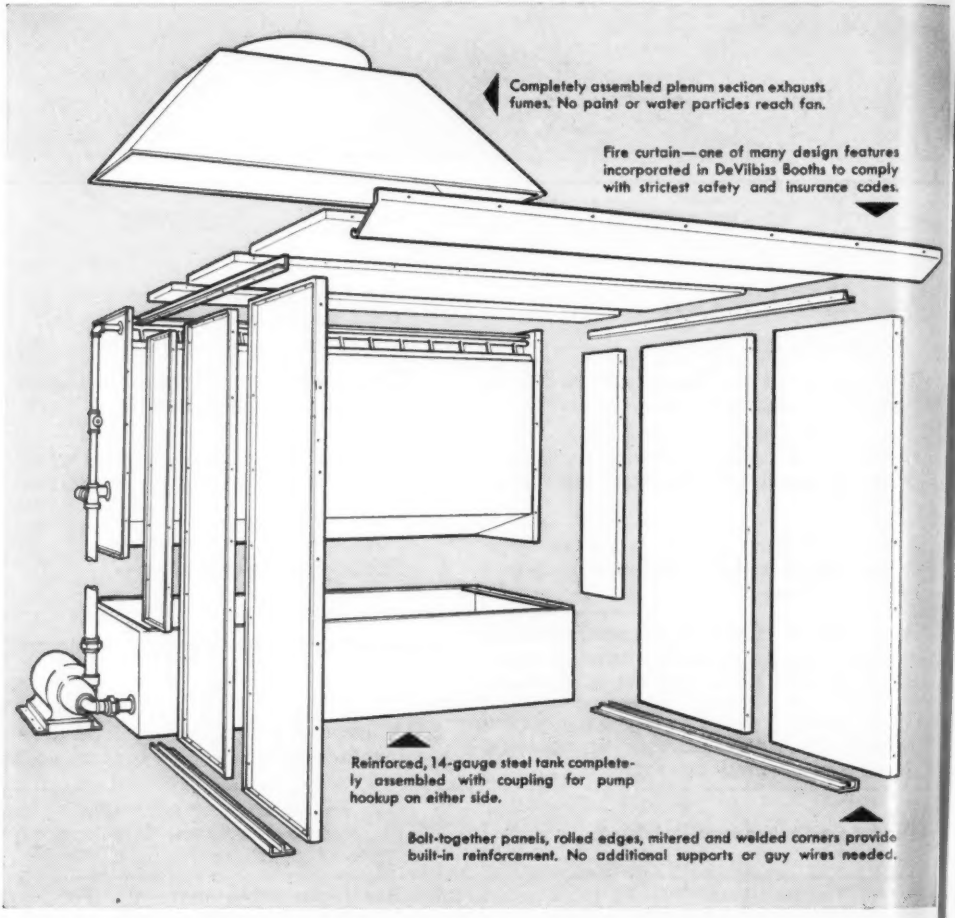
A tabulation of the different types of contact wheels, how they should be used, and what type of finish is produced . . .

WHEEL ACTION	COMMENTS
Fast cutting, allows long belt life.	For cutting down projections such as weld beads, gates, risers, sprues.
Removes stock but leaves rough to medium ground surface.	For smoothing or blending cut-down projections or surface defects.
Flexibility of rubber allows entry to contours. Medium polishes and light stock removal.	Same as for standard serrated wheels but preferred for the softer, non-ferrous materials.
Plain wheel face allows controlled abrasive grain penetration. Softer wheels give better finishes.	For large or small flat faces.
Hard wheels can remove metal, but not as quickly as cog-tooth rubber wheels. Softer wheels polish to fine smoothness.	Good for medium range grinding and polishing.
Gives uniform polishes. Avoids abrasive pattern on work. Adjusts to contours. Can be preformed for contours.	A low-cost wheel with uniform density at the face. Handles all types of polishing.
For fine polishes and finishing.	Can be widened or narrowed by adding or removing sections. Low cost. For all types of polishing.
Gives uniform polishes and finishes. Polishes and blends contours.	Has replaceable segments. Polishes and blends contours. Segments allow density changes.
Gives uniform polishes and finishes.	
Grinds or polishes depending on density and hardness of inserts.	For portable machines. Uses replaceable segments that save on wheel costs and allow density changes.
Gives uniform finishes.	Adjusts to contours.

(may have to be changed slightly for some jobs.)

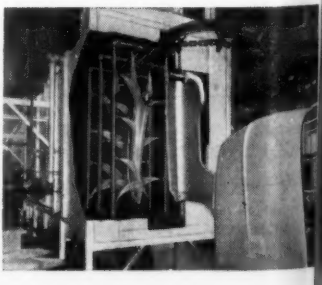
Manning Co., a Division of Norton Co., Troy, N. Y.

How DeVilbiss Standardized Spray Bo

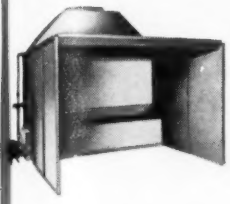

Completely assembled plenum section exhausts fumes. No paint or water particles reach fan.
Fire curtain—one of many design features incorporated in DeVilbiss Booths to comply with strictest safety and insurance codes.
Reinforced, 14-gauge steel tank completely assembled with coupling for pump hookup on either side.
Bolt-together panels, rolled edges, mitered and welded corners provide built-in reinforcement. No additional supports or guy wires needed.

DeVilbiss Spray Guns. Complete range of models for maximum efficiency for all production requirements. Send for Catalog I-2000.

DeVilbiss Flo-Coaters. Save manpower, floor space. Generally used for prime- or single-coat applications Write, stating requirements.



ay Booths save assembly costs



Prefabricated parts bolt together to form a rigid, self-supporting structure. It's quick, easy! Wide selection of sizes and types

More value for your spray-booth dollar. DeVilbiss "ready-made" booths can be assembled quickly and economically by simply bolting standardized parts together; are easily modified to meet future needs. Mass-produced panels, accurately sized and punched, are self-reinforcing . . . form a rigid, free-standing structure. Snug fit provides a smooth, easy-to-clean interior surface.

DeVilbiss Spray Booths have outstanding design and construction features that are responsible for their high paint-trapping efficiency, their ease of installation. And you save on operating costs, too. Perfected design principles reduce power consumption of fans and pumps. Booths stay cleaner longer; require less maintenance time and expense.

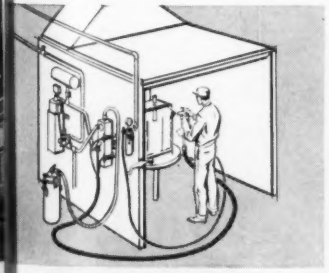
They are manufactured to the standards of the National Board of Fire Underwriters for spray booths as recommended by the National Fire Protection Association.

Selection and delivery are no problem, either. In most cases, one of over 500 standard sizes and combinations will fit your needs. But should you require equipment for a special installation, or help in selecting and pricing components, a DeVilbiss representative will be glad to work with your engineers at no cost or obligation.

PLUS VALUE: At DeVilbiss, you deal with the *only* one-source designer and manufacturer of completely engineered finishing systems or individual components. Call your nearest branch office, today. Or write for a copy of the Spray Booth Catalog I-7000 containing handy selector guide.

DE VILBISS

THE DEVILBISS COMPANY, Toledo 1, Ohio • Detroit, Michigan • Barrie, Ontario • London, England • Branch Offices in Principal Cities



DeVilbiss Hot Spray. Provides heavier film build, with faster drying, less overspray, fewer rejects. Send for Bulletins IE-114B and F-286.

DeVilbiss Fluid Hose. Unsurpassed for resistance to solvents, oils. Flexible, kink-proof. Full line of connections. Send for Catalog IE-E.

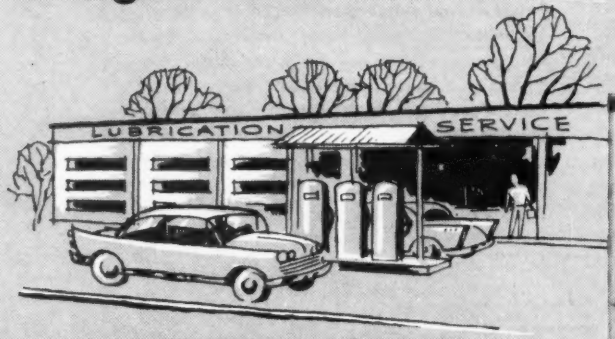
For more data circle 333 on Postpaid Card

CLINCO

Synthetic

BAKING ENAMELS

stand up under toughest conditions



Triple A Specialty Company uses CLINCO for their "Silver Beauty" Chargers because —

- Better Gasoline Resistance
- Increased Battery Fluid Resistance
- Porcelain Type Hardness
- Withstands 200 Hours (minimum) Salt Spray
- 1000 Hours Humidity Resistance
- Maximum Resistance to Oil and Grease
- Superior Impact Resistance

Your Inquiries Invited

THE CLINTON COMPANY

PIONEERING QUALITY INDUSTRIAL FINISHES SINCE 1928
1220 ELSTON AVE. • CHICAGO 22, ILL.
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For more data circle 334 on Postpaid Card

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ANNIVERSARY
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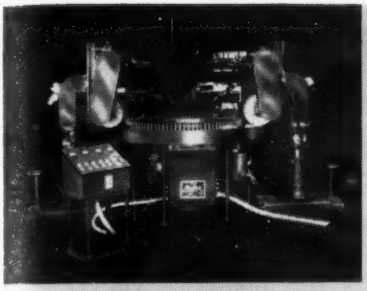
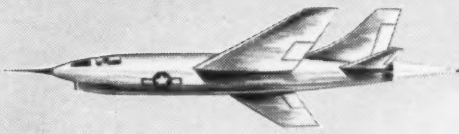


packer's
engineering
and **development**
can help you.

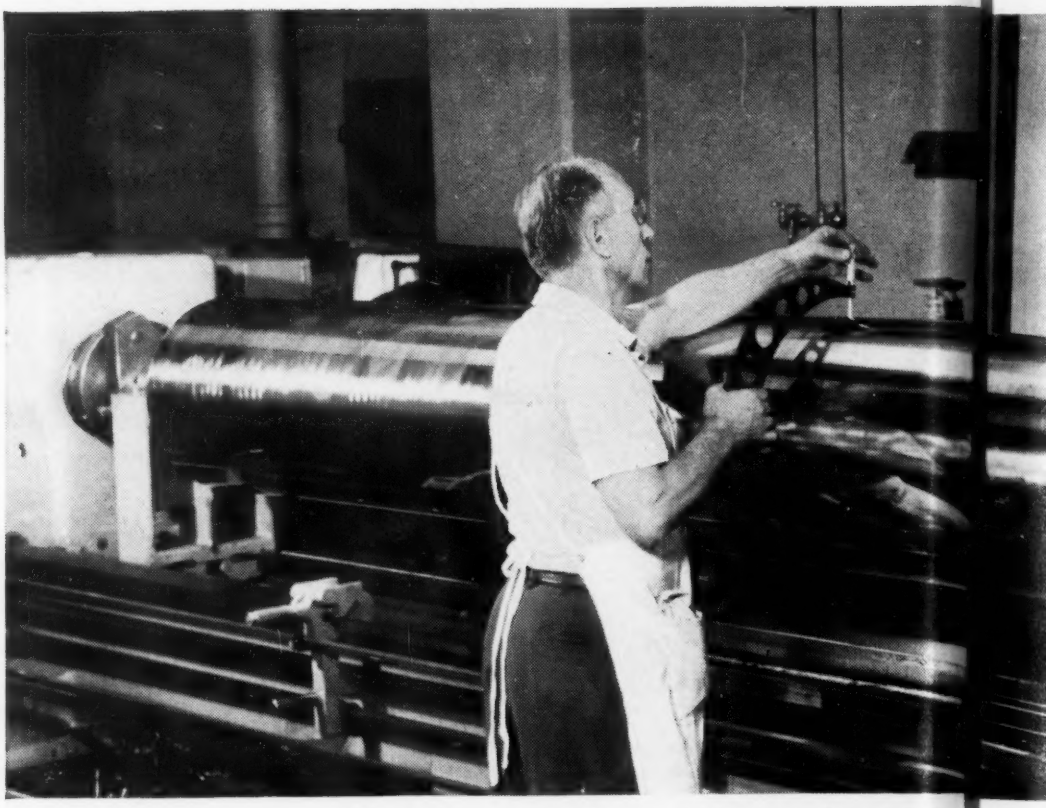


If your problem is finishing to a rigid jet aircraft part specification or finishing with the speed and economy needed for a simple bobby pin, lipstick or cosmetic case a PACKER-MATIC automatic machine can meet your demand for quality, efficiency and economy. Send blueprints or sample. Our engineers will recommend the PACKER-MATIC to speed production and cut costs.

packer-matic

THE PACKER MACHINE COMPANY
MERIDEN, CONN.

PIONEER MANUFACTURERS OF AUTOMATIC POLISHING AND BUFFING MACHINES
For more data circle 335 on Postpaid Card

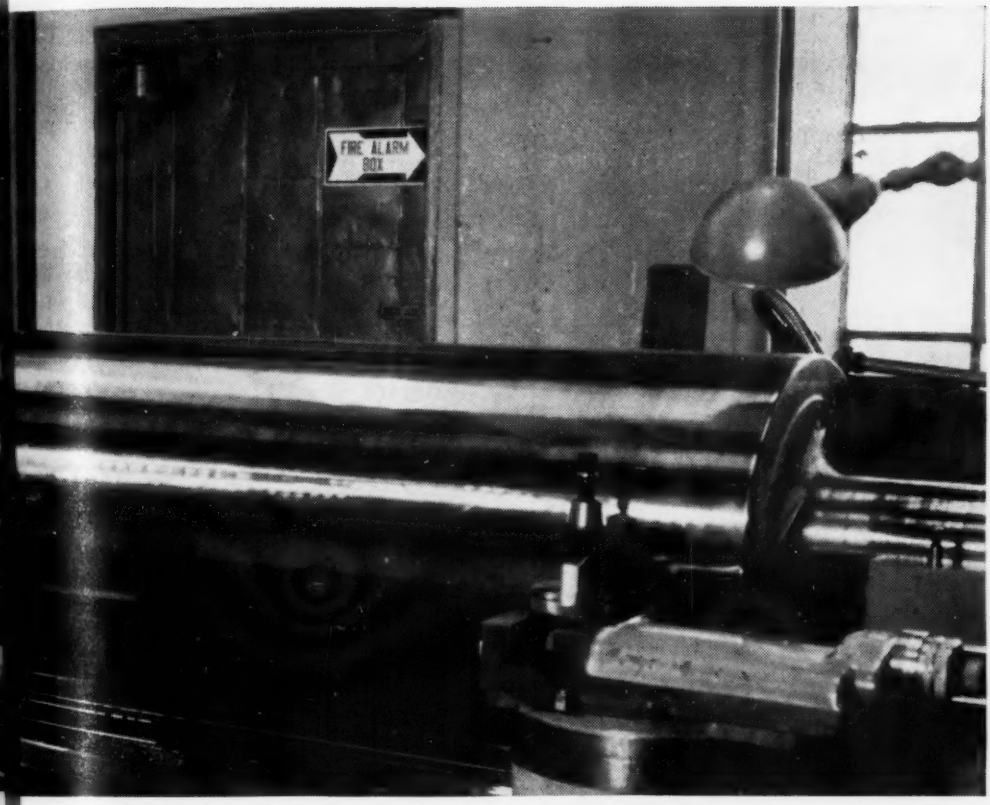


The 152-in.-long, 3-ton rotogravure cylinder above will be used to print patterns on vinyl-plastic floor coverings. National Gravure

New rotogravure plant plates rolls up to 152" long — keeps quality high, costs low with "Plus-4" Copper Anodes

The big new plant of National Gravure Cylinders, Inc., in Long Island City, N.Y., was designed to embody the most modern equipment, new and improved methods for the economic production of quality gravure cylinders.

In king-size acid-copper electroplating tanks, 152-in., 3-ton, rolls shown above get a dense, uniform shell of copper .030" thick. Other tanks produce cylinders in sizes more commonly used. All tanks have used "Plus-4" Phospho-



Cylinders, Inc., also makes the more common cylinders used for commercial-advertising package wraps, cartons and labels.

rized Copper Anodes since the plant opened a little over a year ago.

The results: **1.** No scrap—anodes are completely used up in the tanks. **2.** Practically no sludge. **3.** Simple tank maintenance — solution concentrations are tested occasionally and only minor corrections have to be made.

WRITE FOR INFORMATION on how you can obtain a test quantity to supply one tank. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

58138

ANACONDA®

"PLUS-4"® ANODES Phosphorized Copper

MADE BY THE AMERICAN BRASS COMPANY

For more data circle 336 on Postpaid Card

New Equipment, Materials, Processes

Polishing, Buffing, Degreasing, Cleaning, Barrel Finishing, Plating, Anodizing, Phosphatizing, Baking, Vacuum Metalizing, Chromate Coating, Paint Finishing, Waste Treatment

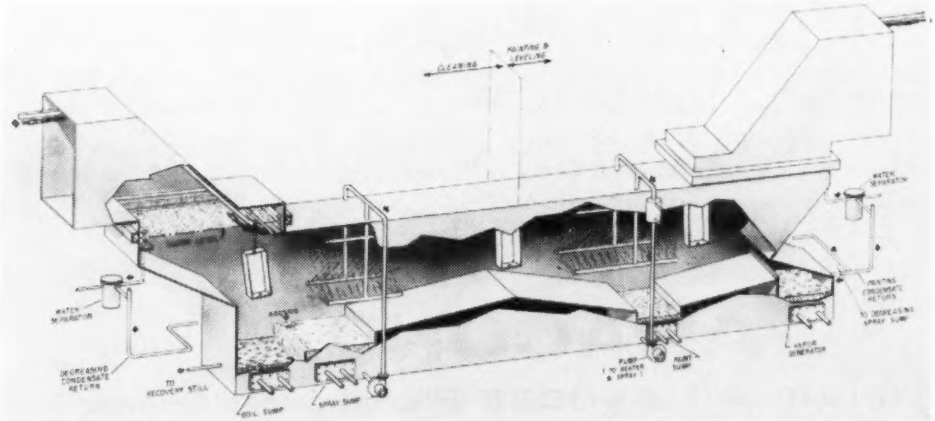
Combination Degreasing-Painting Process

A finishing method recently announced by Du Pont makes it possible to vapor degrease, paint and dry parts in a single machine. All operations take place beneath a trichlorethylene "blanket," with paint applied by flow coating.

The same solvent—trichlorethylene—is used for degreasing as well as paint thinning.

Both air dry and baking-type paints can be formulated with trichlorethylene solvent, the company states. When an air-dry paint is used, parts leave the machine dry and ready for shipping or assembly. When baking-type coatings are applied, it is often possible to apply both primer and finish coat and then bake both at one time.

Advantages listed by Du Pont for the new process include reduction of fire hazard (no flammable solvents are used anywhere in the process); savings in utilities costs and floor space by use of only one machine for cleaning and painting; economies in paint and solvent consumption, since both paint



Cutaway drawing shows important parts of machine that degreases, flow-coat paints and drains parts being finished. Trichlorethylene serves as degreasing solvent, paint thinner.

and solvent are reclaimed, and little is wasted.

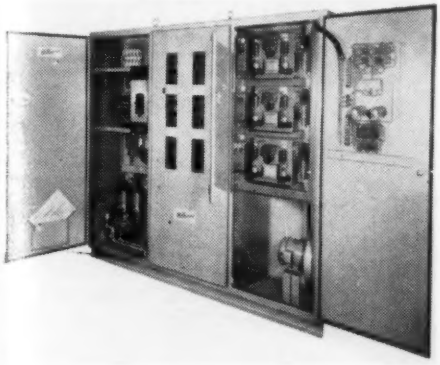
Manufacturer: E. I. du Pont de Nemours & Co. (Inc.) Electrochemicals Dept., Wilmington 98, Del.

For more data circle **1** on Reader Service Card

★ ★ ★

Electronic Oven Controls

Electronic power controllers for electric infrared ovens, recently announced by Weltronic Company, are said to make possible truly variable, stepless control of power and resulting heat.



Weltronic Electronic Infrared Oven Controller

Control is achieved through the use of electronic thyratron and ignitron tubes, and a phase-shifting control device. Absence of magnetic contactors and mechanically moving parts reduces maintenance problems, it is stated.

Any percentage of the total power available may be delivered by setting a single dial. Automatic switching between pre-set high-heat and low-heat levels when conveyors are not constantly loaded; automatic shut-down if oven fans fail to operate or temperatures build too high.

Manufacturer: Weltronic Co., 19500 W. Eight Mile Rd., Detroit 41, Mich.

For more data circle **2** on Reader Service Card

Aluminum Finishing Process

All-Brite Chemical Corporation has filed patent applications on a chemical oxidizing process that is said to substitute for anodizing.

Called Anobrite, the recently announced process produces colors similar to those produced by anodizing. In addition, the surface produced is bright and has excellent corrosion resistance, the developer states. Processing can be done in a basket.

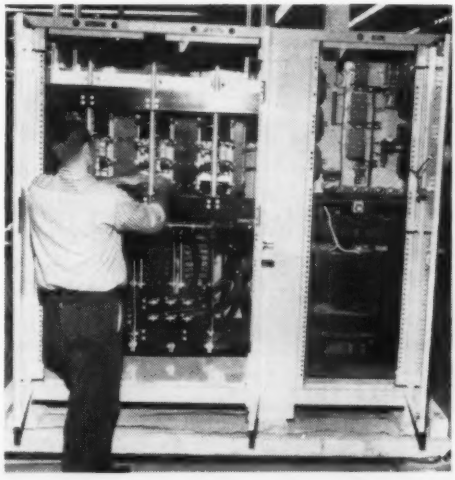
Developer: All-Brite Chemical Corp., P. O. Box 136, Watertown, Connecticut.

For more data circle **3** on Reader Service Card

★ ★ ★

Water-Cooled Silicon Rectifier

Description: A water-cooled silicon rectifier developed by General Electric's Low Voltage Switchgear Department employs saturable reactor-amplistat control to maintain the de-



A workman inspects water-cooled bus in General Electric's silicon rectifier, which is designed for steel, electrochemical, plating and other continuous processing lines. Unit utilizes saturable reactor-amplistat control, sealed cell-cooling system.

sired current level within plus or minus one per cent, with unit efficiencies ranging from 90 to 95 per cent, depending upon voltage rating of the equipment.

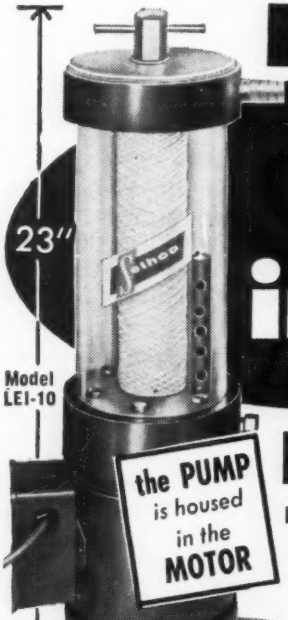
Available in ratings of 1,000 to 10,000 amperes and up to 300 volts, the rectifier may be either manually or automatically controlled by means of the saturable reactor, which provides stepless control from 10 to 125 per cent rated current output.

The saturable reactor restricts short-circuit current to a value about 20 per cent greater than the current prior to the short circuit. The rectifier is designed to withstand such an output without damage to components.

A completely sealed cell-cooling system greatly reduces the possibility of leaks. Use of a water-cooled bus bar eliminates the need for rings and gaskets, makes it possible to change cells without draining the system.

To provide for rapid fault isolation and simplified maintenance, the panel is equipped with indicating lights and an alarm bell which indicate transformer over-temperature, reactor over-temperature, cooling water over-temperature, water flow failure, and fuse failure.

Each silicon cell is connected to a current-limiting fuse that quickly removes the cell from service if it fails to rectify and, at the same time, maintains operation of the rectifier. In the event that a fuse is blown, a fuse - monitoring circuit sounds an alarm and makes



NEW!

Sethco all-in-one

150 GALS. PER HR.

FILTER PUMP UNIT

LEAKPROOF, SPACE-SAVING and PORTABLE

FULL VIEW CHAMBER: High temperature Epoxy-Lucite to 140° F. or Epoxy-Pyrex to 250° F. • **FILTER TUBES:** Cotton, Dynel, Porous Stone or Porous Carbon. • **CANNED PUMP:** Corrosion resistant stainless steel, centrifugal, self-lubricating and leak-proof. No seals, no stuffing box needed. • **MOTOR:** ⅛ HP, 110v, 60cy, 1 ph, Totally enclosed. With thermal starting and overload relay. • **HANDLE:** for easy portability where it's needed. • **BASE:** Corrosion resistant high temperature Epoxy.

WRITE for Illustrated Folder

Sethco Mfg. Co.

2292 Babylon Tpke., Merrick, L. I., N. Y.

For more data circle 337 on Postpaid Card

Sylvania's new catalog of vacuum metallizing coils lists 164 shapes and sizes. Most of these have become standards for efficiency in the applications for which they were designed.

Whether your interest is in finished coils or top-quality stranded wire, if you form your own coils, Sylvania can help you.

Here's how to find the one coil that's best for you

Sylvania can help analyze your coil needs if you supply us with the following information:

1. What type and weight material is being evaporated?
2. What material is being coated?
3. What is the length and diameter of your equipment?
4. What is the power supply to the coil and the distance between electrodes?

Address this information or your request for Sylvania's new catalog to:
Vacuum Metallizing Coils
Sylvania Electric Products Inc.
Towanda, Pennsylvania.

SYLVANIA

Sylvania Electric Products Inc.
Chemical & Metallurgical Div.
Towanda, Penna.

TUNGSTEN • MOLYBDENUM • CHEMICALS • PHOSPHORS • SEMICONDUCTORS

For more data circle 338 on Postpaid Card

a count of blown fuses. The rectifier remains in operation unless two or more fuses are blown in the same phase.

Two fans are used to compensate for heat losses occuring in the transformer and saturable reactor.

Manufacturer: General Electric Co., Schenectady 5, N. Y.

For more data circle **4** on Reader Service Card

Auxiliary Test Stations for Leak Detection

Two auxiliary leak-test stations for vacuum pumps, the PSM-102 (semi-automatic) and the PSM-202 (automatic) are designed to simplify hooding, probing, and "inside-out" leak-detection with mass-spectrometer-type leak detectors.

The self-contained units, recently introduced by Rochester Division, Consolidated Electrodynamics Corporation, operate independently of associated leak-detector pumping systems, utilize "building - block" techniques to permit connection of two or more stations, in series, to increase the number of test ports available for component leak testing during quantity production runs. The stations also may be used for backfilling operations at the completion of leak-test cycles.

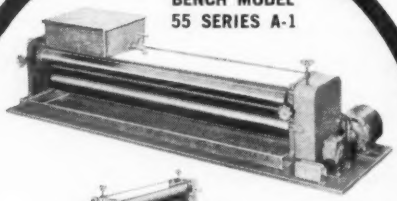
Special features include easy conversion from single- to two-port system; pressure protection for associated leak-detection equipment. Units are adjustable over the range of 10 to 300 microns. The unit accommodates varied pump sizes for tailoring the sys-

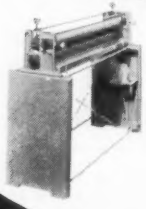
roll on more profits with NEW, low cost

Saves up to 40% on time and materials!

WALCO PRECISION BENCH COATER

BENCH MODEL
55 SERIES A-1





FLOOR TYPE
51 SERIES C-1

SAVES TIME . . . Walco's new improved roller applies any container coating material in a modern, efficient way. Cuts labor costs up to 40% by actual records.

SAVES MATERIALS . . . No waste of expensive coating materials. It all goes on the job at a predetermined, uniform thickness. Exclusive spring-loaded discs prevent coating material from seeping over ends of rollers.

Get these savings now, roll on more profits . . . write for descriptive literature. If you have a special coating problem, Walco engineering will solve it . . . and at reasonable cost to you.

Contact your dealer or write to

L. R. WALLACE & CO.
Manufacturers
172 North Vernon Ave.
Pasadena, Calif.

For more data circle 339 on Postpaid Card

SUNDSTRAND

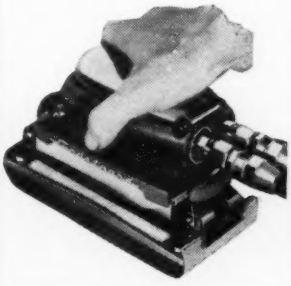
Choose from six sizes of

"Job-proved" Air Sanders

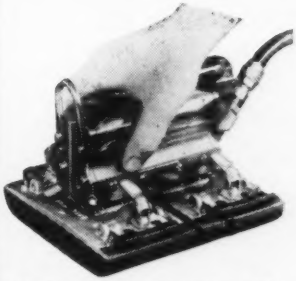
...then watch output climb!

Six sizes of Sundstrand Air Sanders—weighing from 3 to 30 lb—all suitable for wet or dry sanding, give you unmatched freedom of choice. Let us show you advantages of each—without obligation, of course.

OS-800—lightest weight orbital air sander on the market, at only 3 lb, packs the power and speed needed for production jobs.

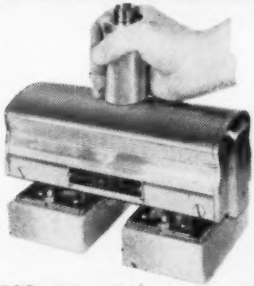


OS-700—single-pad orbital sander, weighing 5 lb, operates over 6000 cycles per minute.

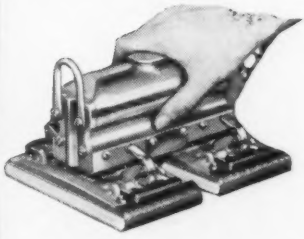


1000—straight-line sander with big abrasive area, operates at 2500 oscillations per minute, palm lever control, 7½ lb.

SP-101—straight-line, single-pad sander, 3000 oscillations per minute, 5 lb.



600—heavy-duty, straight-line unit for sanding, pumice rubbing, or polishing, 1100 oscillations per minute.



4000—straight-line, two-pad sander with longer, slower stroke, 2100 oscillations per minute, 9 lb.

PNEUMATIC PRODUCTS

Sundstrand Machine Tool Co. • 2531 Eleventh St., Rockford, Illinois

SUNDSTRAND

A name to remember in **AIR SANDERS**

For more data circle 340 on Postpaid Card

tem to individual applications.

The PSM-202 provides a completely automatic test cycle from the time the operator pushes a button until the component is vented and the test cycle is completed. The PSM-102 may be operated semi-automatically or manually, as required.

For further information, write for Bulletin 4-62.

Manufacturer: Rochester Div., Consolidated Electrodynamics Corp., 1775 Mount Read Blvd., Rochester 3, N. Y.

For more data circle **5** on Reader Service Card

★ ★ ★

Linen-Textured Vinyl Coating

A linen-textured vinyl coating called "Texkote" is useful as an electrical insulator (resists loads up to 7000 volts) and also has excellent resistance to chemicals, water and heat. Based on Bakelite vinyl resins, the attractive finish is being used on various pieces of electrical equipment. Abrasion resistant, it can be applied to flat sheets, will withstand subsequent forming operations.

Manufacturer of Vinyl Resin: Bakelite Co., a Division of Union Carbide Corp., 655 Madison Ave., New York 21, New York.

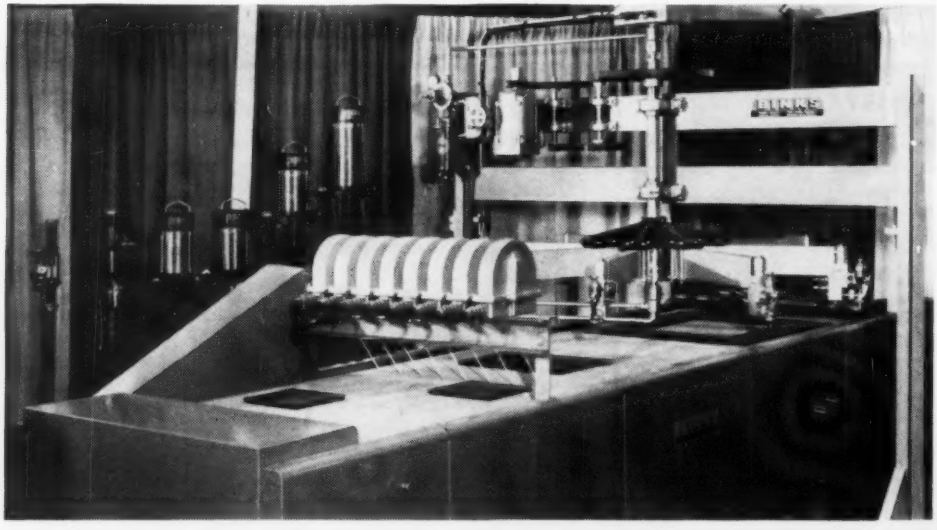
For more data circle **6** on Reader Service Card

★ ★ ★

Control for Automatic Spray Guns

Binks Manufacturing Company has introduced an electrically operated mechanical control for automatic spray guns. A series of these controls is used to open and close the valves of a series of automatic spray guns so that each gun sprays only when the part is before it.

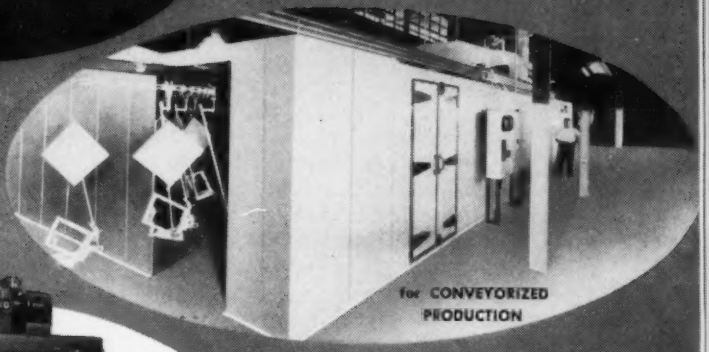
The part being sprayed is carried on



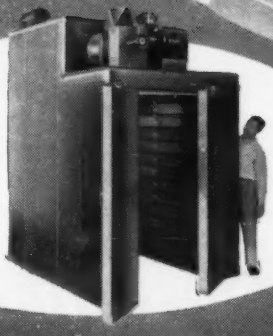
Eight Binks "Memory Timer" units on this automatic spray machine control the eight automatic spray guns. As each part moves by on the conveyor it triggers the sensitive fingers of the timers. These fingers are held open as long as the part is beneath them. Larger sections of a part open the fingers for a longer time. Fingers then signal the controls, which actuate the spray guns for the length of time needed to spray the part.

For more data on advertisement on opposite page, circle 341 on Postpaid Card →

KIRK AND BLUM
INDUSTRIAL OVENS



for CONVEYORIZED PRODUCTION

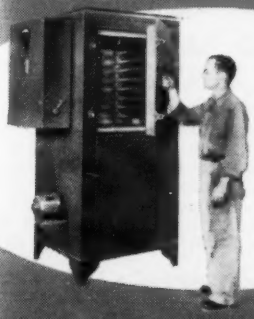


for BATCH PRODUCTION

Specially designed to solve your problem . . . KIRK & BLUM Ovens meet all needs for drying, baking, dehydrating or other more specialized requirements.

Often Kirk & Blum Ovens up to freight car size are shipped completely assembled, tested and ready to operate. Then, they can be connected and in use in a few hours, saving time and expense. Illustrated are typical installations which show the wide range of KIRK & BLUM experience over more than 47 years.

If you have an oven application, discuss it with a KIRK & BLUM Engineer. There's no obligation. Write for free literature.



for TESTING or LABORATORY

THE KIRK & BLUM MFG. CO.,
3116 Forrer St., Cincinnati 9, Ohio

KIRK AND BLUM
INDUSTRIAL OVENS

a conveyor. Before it reaches the automatic spray guns the part passes beneath a series of sensing fingers that are raised while the part is passing under them. Each of these fingers controls an automatic spray gun, opening it for as long as is required for the part to pass by. The finger signals the control mechanism, which in turn opens the spray gun just as the part begins to move beneath and closes it as the trailing edge passes the gun.

By allowing the guns to spray only while there is a part beneath them, overspray is lessened.

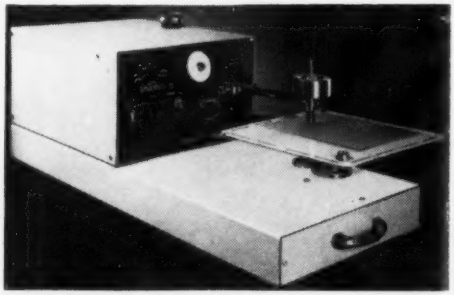
Installation and maintenance of the system is relatively simple, the manufacturer reports.

Manufacturer: Binks Manufacturing Co., 3118-40 Carroll Ave., Chicago 18, Illinois.

For more data circle **7** on Reader Service Card

Multiple-Use Film Tester

Description: The Wynn Film Tester rates coatings for cohesion, adhesion, mar and abrasion resistance, impact resistance, scrub resistance and cross-hatch brittleness. These factors are



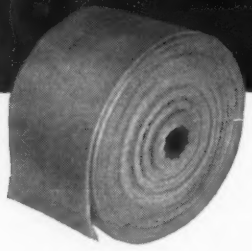
Film Tester: rates cohesion, adhesion, abrasion, impact, scrubbability, brittleness

rated numerically by various specialized tools which are attached to the machine.

Special panels are not required, as

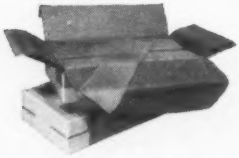
For Dust Free Finishes!

BOND TACK CLOTH



IN ROLLS

Cut off any size piece to use as needed.



IN BULK

Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available In Rolls or Cut Bulk—White or Gold

In Four Different Types of Cloth

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up! Choice of Standard, Extra Tacky or Less Tacky, as desired.

The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" or 9" x 18" for ease of handling. ALL BOND TACK CLOTH is *Spontaneous Combustion Proof, Lint-Free and Wax-Free.* Gives a sparkling speck-free Finish *every time.* Clean and Sanitary. No waste.

TRY THEM and COMPARE RESULTS. Samples Gladly Sent Upon Request.

"The Tacky Wiper Specialists"

Bond® **CHEMICAL PRODUCTS CO.**

2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS

ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES —144 to the Carton

A WARRANTY OF SATISFACTION IN EVERY CARTON

For more data circle 342 on Postpaid Card

Workman using Perma-Gun to weld a plastic seam onto the polyvinyl chloride lining of a tank. These tools are also used for repairing plastic duct work.

REPAIR YOUR OWN TANKS

Here are professional tools for repairing damaged polyvinyl chloride lined tanks in your own plant at low cost.

TESTING
The smallest leaks can be detected easily.

PATCHING
If damaged area is large, cut out and cement a patch in place.

SEAMING
Use Perma-Gun to weld seam and make it a homogeneous part of the lining. Seam material is furnished.

A single tank repair job can pay for the set of Perma-Line Tank Repair Tools shown below. These are professional tools developed by us over a period of 18 years, designed to give years of rugged service, and used by our own men to detect leaks and repair damaged plastic linings as good as new.

These tools are now in use by people who say the spark tester alone is worth the price because of its value in preventive maintenance.

Order your Perma-Line Tank Repair Tools now. Complete instructions for use are included. Send check or money order.

Here are the complete Perma-Line Tank Repair tools for repairing any polyvinyl chloride lining.
All for $159.00 post paid.

Perma-Line High Frequency Spark Tester
1 Can of Solvent and 2 Cans of Cement
Dual Seamer— for Flat Surfaces and Corners
Stitcher
Roll of plastic seaming material
Heat-resistant Stainless Steel Perma-Gun
Sheet of plastic patching material
Utility knife

Perma-Line PRODUCTS

PERMA-LINE RUBBER PRODUCTS CORPORATION
1753 N. Winnebago Ave., Chicago 48, Illinois • Humboldt 9-2020

For more data circle 343 on Postpaid Card

the testing table is so constructed that run-of-the-mill laboratory panels, regardless of size or thickness, can be evaluated quickly. Tests which require skill, experience and judgment on the part of the operator can be made quickly and accurately on the Wynn Film Tester, with results reproducible in any lab, the manufacturer states.

Manufacturer: Forma Scientific, Inc., Box 543, Marietta, Ohio.
For more data circle 8 on Reader Service Card

★ ★ ★

Low-Sludge Nickel Anode

A nickel anode introduced by Hanson-Van Winkle-Munning Co. is cast from an alloy that produces little sludge during plating. It aids in plating recesses and low-current-density areas. The "Lo-Sludge" anodes corrode evenly, produce a minimum of metallic and carbon sediment. No bags are required. Patents are pending.

Substantial markets for the alloy are anticipated in the form of auxiliary anodes used to plate bright nickel areas of low current density. Automotive design offers numerous opportunities in this category in the form of surfaces that cannot be given a thick coating of bright nickel by conventional processes.

Appliance manufacturers may also benefit. For instance, it has been difficult to acquire a smooth nickel coating on the insides of coffee percolators using the normal cycle of clean,

A CORROSION-PROOF
THERMOSETTING
COMPOUND FOR LINING

Chemical Storage Tanks • Processing Tanks
Pickling & Plating Tanks • Pits & Foundations

This new lining material resists the effects of alkalies, acids and solvents. COROLINE can be easily applied with trowel or brush in thicknesses ranging from 1/16" to 3/16". COROLINE can be applied by the customer or by Ceilcote personnel in the field or factory.

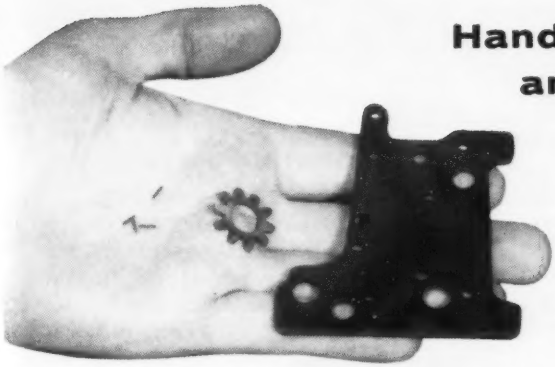
Write today for the COROLINE TECHNICAL BULLETIN

THE CEILCOTE CO., Inc.
4848 Ridge Road • Cleveland 9, Ohio

*Birmingham, Alabama • Buffalo, New York • *Chicago, Illinois • *Cleveland, Ohio • *Detroit, Michigan • Evansville, Indiana • *Houston, Texas • Kansas City, Missouri • Los Angeles, Calif. • *San Francisco, California • Seattle, Washington • Springfield, Massachusetts *Warehousing

3018-CC

For more data circle 344 on Postpaid Card

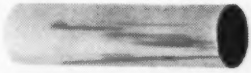


Hand Your Deburring and Finishing Problems to ALMCO...

These companies did... and cut costs, improved quality, increased production!

HAND DEBURRING spark plug bushings at Canadian Pratt & Whitney cost $104.20 per M with 12½% rejected. ALMCO machines cut costs by 97%, practically eliminated rejects!

SMALL GREASEGUN coupler jaws (¼" x ⅜") could not be deburred manually at a midwest screw products firm. Now an ALMCO barrel finishing machine deburrs 40,000 coupler jaws in 10 hours!



MANUAL DEBURRING and polishing of delicate instrument and pen parts was costly at J. Bishop & Co. An ALMCO machine upped output from 200 to 6,000 parts per hour, cut costs by 98.8%!

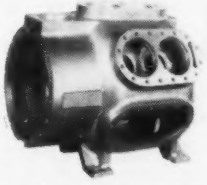
INCREASED PRODUCTION quotas demanded faster finishing at Alco Valve Co. Hand deburring and polishing finished only 200 stainless steel parts per hour. ALMCO machines now barrel finish 1,400 parts per hour!

FILING BURRS by hand costs $55 per 100 needle plate forgings at Landis Machine Company. ALMCO barrel finishing cut costs to 55 cents per 100 parts, a saving of 99%!

HEAVY WORK LOADS of roller bearings presented serious finishing problems at the Timken plant in Columbus. Now special heavy-duty ALMCO barrel finishing machines are processing two tons of rollers per load!

Large Parts too are Almco Barrel Finished!

AT AN IOWA FOUNDRY an ALMCO barrel finishing machine deburrs, polishes 48 washing machine agitators per hour. Fixtures hold castings firmly in barrel. Rough edges are completely removed, castings get high polish.



AT AN AIR CONDITIONING firm, 100 lb. compressor housings are ALMCO barrel finished. The ALMCO process breaks sharp edges of castings, cleans internal surfaces and improves surface finish. Two housings are cleaned in a 20 minute cycle.

Send Your Parts to Almco's Modern Test Lab

Simply write on letterhead, sending parts direct to Albert Lea, enclosing specifications. FREE report will include recommendations. 52 PAGE BARREL FINISHING HANDBOOK SENT ON REQUEST.

ALMCO

QUEEN PRODUCTS DIVISION

KING-SEELEY CORPORATION

812 E. Main St. • Albert Lea, Minnesota

Sales and Engineering Offices in Chicago, Detroit, Los Angeles, Newark, New Haven, Philadelphia

IN ENGLAND: *Almco Division of Great Britain, Ltd., Bury Mead Works, Hitchins, Herts, England*

For more data circle 345 on Postpaid Card

pickle, cyanide copper flash, bright nickel and chromium plate. It is not feasible to use anode bags in this cycle because anode bags will carry over contaminating solutions and cause anode polarization. If the typical nickel anodes are used without bags, the nickel deposit will be rough. The Lo-Sludge alloy anodes are designed to solve this and similar problems.

Manufacturer: Hanson-Van Winkle-Munning Company, Church St., Matawan, N. J.

For more data circle **9** on Reader Service Card

★ ★ ★

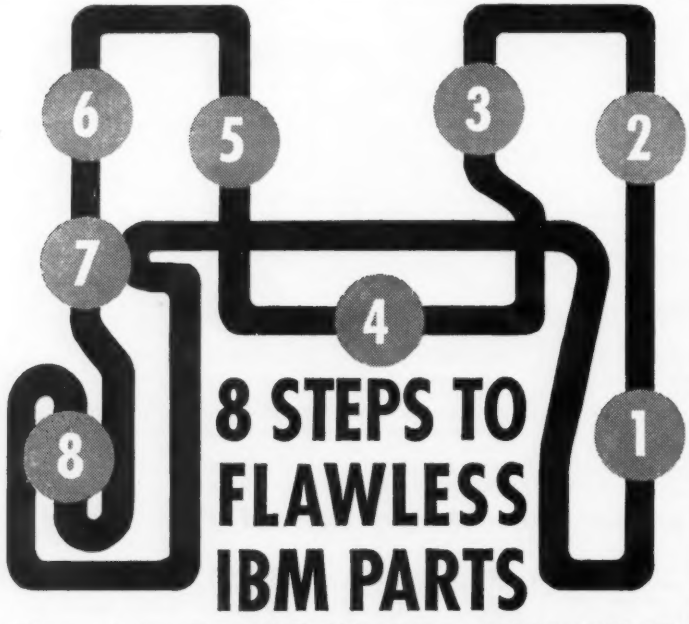
Non-Foaming Spray-Wash Cleaners

Cleaners SW-57 and SW-58, powdered alkaline materials for use in pressure spray washing machines, contain surfactants that are said to give maximum detergency with a minimum of foam. Both remove oil, solid dirt and other shop soils quickly and completely.

Cleaner SW-57 is mild in alkalinity and safe for use on reactive metals such as zinc and aluminum. Cleaner SW-58 is designed for cleaning steel, copper, brass and magnesium.

Both cleaners are effective at concentrations of one to four ounces per gallon and at temperatures of 150-200 deg. F. They can be used in all types of spray - washing machines or as immersion cleaners.

For most applications, either Cleaner SW-57 or Cleaner SW-58 alone will do the complete cleaning job; for buff-



The new 8-stage Despatch Finishing System at Holbrook Merrill Co., San Francisco, turns out parts that meet IBM's exacting standards.

Here are the components: 1. Washer 2. Dry-Off Oven 3. Prime Spray Booth 4. First Stage Vinyl Spray Booth 5. Prime and First Vinyl Bake Oven 6. Second Vinyl Spray Booth 7. Dry Booth 8. Second Vinyl and Texture Bake Oven.

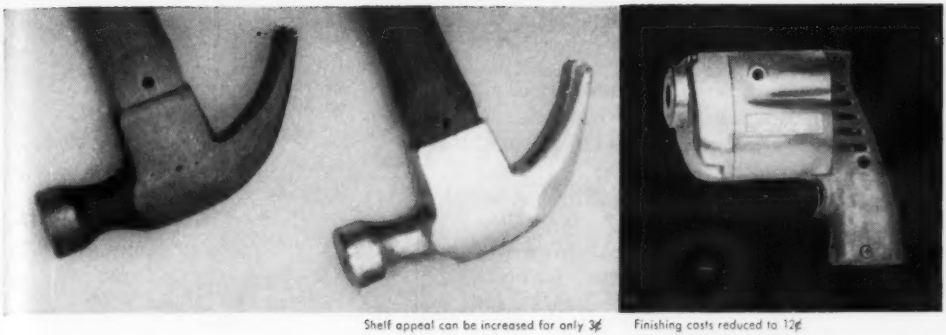
Perfect parts through outstanding engineering. Call on Despatch to solve *your* heat engineering problem. *Write or call:*

DESPATCH OVEN COMPANY
619 S. E. 8th St., Minneapolis 14, Minn., Dept. 53E

DESPATCH

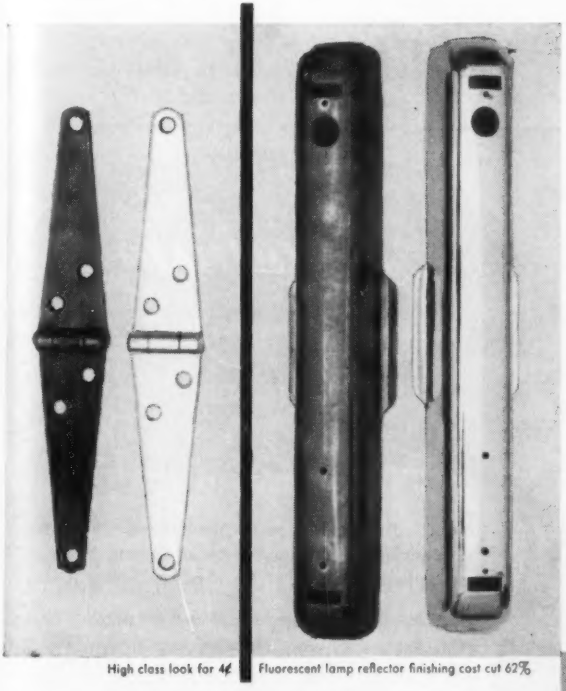
DESPATCH

For more data circle 346 on Postpaid Card



Shelf appeal can be increased for only 3¢ Finishing costs reduced to 12¢

If It Looks Good... It Sells Better



High class look for 4¢ Fluorescent lamp reflector finishing cost cut 62%

If you're looking for a way to increase the sales appeal of your products by adding a quality appearance at low cost, you should investigate vacuum coating.

While this modern process is not a cure-all, most likely you'll find it will add new life to the items you manufacture — and may cut your costs spectacularly, too! Brilliant, eye-catching, metallic finishes, in a wide range of colors, can be applied on plastics, metals, wood, glass, paper, fabrics and many other materials. Today's vacuum coatings are brighter than buffed and polished electroplating, cost less, and in some applications stand up better.

You don't have to take chances, either. Send us a sample of your product and give us details about its use. We'll tell you whether your application is a good one, show you how your product will look, and estimate your costs. Then, if you want, we'll supply a complete installation, guarantee its output, show you how to run it efficiently, and even train your operators. Write us today!

A Subsidiary of National Research Corporation

DEPT. 23-Z, CHARLEMONT ST., NEWTON, MASS.

NRC

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EQUIPMENT CORPORATION

For more data circle 347 on Postpaid Card

ing compound removal, either cleaner used in the second stage of the washing machine rapidly removes the emulsions or solvents remaining on the work from the first or buffing-compound-removal stage.

Literature on Cleaners SW-57 and SW-58 is available from the manufacturer.

Manufacturer: Enthone, Inc., 442 Elm St., New Haven, Conn.

For more data circle **10** on Reader Service Card

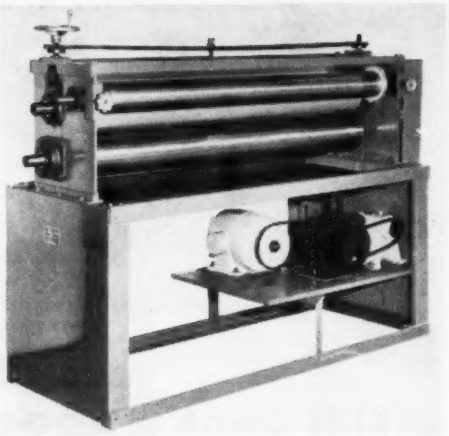
★ ★ ★

Roller Coater

The Walco Coater is designed to apply a controlled film thickness of paint, drawing compound, adhesive or other coating material to any flat surface up to 48 inches wide.

Coats up to 15,000 square feet per hour, uses as little as one gallon for 850 square feet. Will coat materials up to 1½ inches in thickness.

Coating material is distributed to the coating rollers automatically.



Walco Roller Coater: uniform coatings

Rhodium
ELECTROPLATING
SOLUTIONS
Consult our staff about your plating problems.
SIGMUND COHN MFG. CO. INC.
121 SOUTH COLUMBUS AVE. MOUNT VERNON, N. Y.
SINCE 1901
Technological knowledge acquired through many years of experience, plus special processes and equipment, assure the high quality of our Rhodium Plating Solutions.
Recommended for contact surfaces of switches, waveguide parts and other electrical applications, such as printed circuits...Can be applied in extremely heavy deposits, up to 100 milligrams per square inch.
Rhodium plating provides the advantages of whiteness, lustre and corrosion resistance of a precious metal.

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THERE'S A BETTER WAY... **to protect your products!**

Chances are your products will never have to weather a raging sandstorm, but where severe abrasive forces are encountered, Glidden finishes provide *real umbrella protection.*

Glidden finishes are custom-formulated to give your products the special protection they need against abrasion, corrosion, impact, fading, staining and all other enemies of product finishes.

Should you be faced with a finishing problem, Glidden Technical Service will help you find the solution. It's the most thorough and practical in the industry, and includes complete problem analyses *in your plant* by experienced technicians.

Glidden Finishes and Glidden Technical Service add up to *real umbrella protection,* whatever your product, process or finishing problem.

QUALITY Glidden PRODUCTS

FINISHES FOR EVERY PRODUCT

The Glidden Company

INDUSTRIAL PAINT DIVISION

900 Union Commerce Bldg., Cleveland 14, Ohio

For more data circle 349 on Postpaid Card

"THE GLIDDEN UMBRELLA"
of protection combines comprehensive technical service and custom-formulation of product finishes for all industry.

Spring-loaded reservoir discs prevent coating material from flowing over the ends of the roller.

Specifications: Chain-driven rolls; precision-made adjusting mechanism; all rolls run in ball bearings; drip-proof reservoirs; ¼-h.p. electric motor.

Applications: Applying paints to flat surfaces; applying drawing oils to sheets; coating signs and sheets for fabricated steel products.

Manufacturer: L. R. Wallace & Co., 172 North Vernon Ave., Pasadena, California.

For more data circle 11 on Reader Service Card

★ ★ ★

Self-Cleaning Pipeline Strainer

An improved pipeline strainer recently introduced by Sarco Co., Inc., removes dirt, scale and chips from fluids flowing through pipelines, prevents damage of temperature and pressure regulators, steam traps, pumps, meters, other equipment.

The screen used in this strainer is designed to fit the unit tightly and to prevent particles from bypassing the screen at the ends. The rigid construction of the perforated metal prevents rupture of the screen when accumulated sediment creates abnormal pressure differentials, the manufacturer states.

Bodies are semi-steel, designed to be used up to 250 p.s.i., with tensile strength 30,000 pounds per square inch minimum.

HOLLOW CONE
in complete choice of spray patterns and capacities
FLAT SPRAY
CONTROLLED-FLOW*
SPRAY NOZZLES
*exact control of pattern, impact, volume and distribution for any liquid at any pressure.
FULL CONE
for better washing coating and rinsing
for complete information write for catalog NO. 24
SPRAYING SYSTEMS CO.
3229 RANDOLPH STREET • BELLWOOD, ILLINOIS

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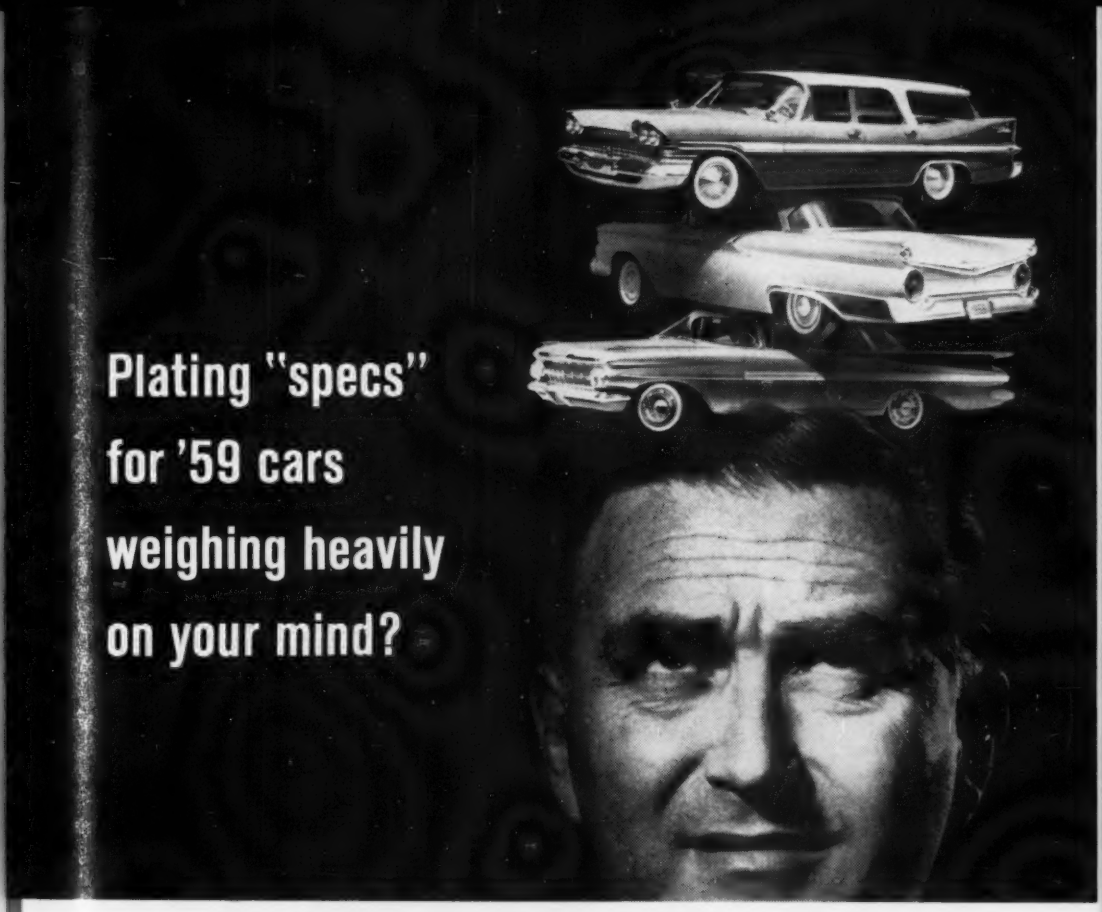

Get more coverage, throwing power, corrosion resistance,
with Unichrome BRIGHT CRACK-FREE CHROMIUM

Unichrome Bright Crack-Free Chromium not only helps you avoid rejects in plating new and unfamiliar parts, but also multiplies corrosion resistance.

With better covering and throwing power, this process gives more uniform plate distribution . . . makes it far easier to get proper plate thickness both on high current density areas and in low current density recesses.

Even more important, you achieve better corrosion protection because of freedom from the microscopic corrosion-admitting cracks which impair ordinary chromium deposits.

Unichrome Crack-Free Chromium baths are self-regulating. You don't need constant chemical analyses to keep these "automated" solutions in proper balance for perfect plating.

Save time, save rejects . . . talk over your chromium plating "headaches" with an M&T engineer.

METAL & THERMIT Corporation
GENERAL OFFICES: RAHWAY, NEW JERSEY
Pittsburgh • Atlanta • Detroit • East Chicago • Los Angeles
In Canada: Metal & Thermit—United Chromium of Canada, Ltd., Rexdale, Ont

For more data circle 351 on Postpaid Card

Strainers are hydrostatically tested and rated for saturated steam or liquids to 250 p.s.i. and 475 deg. F.

Complete specifications and details on these strainers are given in Bulletin 1210 B, available from the manufacturer.

Manufacturer: Sarco Co., Inc., 635 Madison Ave., New York 22, N. Y.

For more data circle **12** on Reader Service Card

Clear Anodize for Magnesium

A clear anodic coating for magnesium alloys that can be applied in less than a minute has been developed by The Dow Chemical Company.

The coating is used under a lacquer or varnish to increase corrosion protection. The clear anodic coating plus a coat of lacquer or varnish provides much better protection than an organic coating alone, according to Dow.

Lacquer or varnish tinted with commercial dyestuffs can be applied over the clear anodize to obtain a transparent effect in a wide variety of colors. The colors have good permanence and are not washed out by detergents, it is stated.

The clear anodize for magnesium is a modification of the standard Dow 17 anodic treatment. The latter results in yellow or green opaque deposits. Clear anodize requires a 40-volt current compared to 70-90 volts for the standard Dow 17. The anodizing baths are identical.

Step by step, the magnesium clear - anodize process is as follows:

1. The metal is buffed with a

Chemists call them urethanes! You'll call them amazing! They're the most corrosion-resistant coatings and special product finishes yet developed.

Besides astounding ability to withstand splash, spillage and fumes of corrosive chemicals, BFC Urethanes are remarkably resistant to abrasion, heat, sunlight and weather and have exceptional flexibility. Two component system is easy to use.

Product specifications, resistance charts, application information and booklet "What Every Maintenance Man Should Know about URETHANE COATINGS" sent FREE on request.

BETTER FINISHES & COATINGS, INC.

276 Doremus Avenue Newark 5, New Jersey

For more data circle 352 on Postpaid Card

The Protective Tape that STRIPS CLEAN without STAINING

Shuford's SHURTAPE FP-53 is a multi-purpose protective tape for use on finished and highly polished surfaces during fabrication, storage and shipment.

This polymer impregnated flat-back paper pressure-sensitive tape is designed for use on surfaces of

• Stainless steel • Aluminum (anodized or allodized) • Glass • Hard rubber • Enameled and lacquered steel

and on many plastic surfaces such as polyester, polystyrene and plexiglass and many plated surfaces.

SHURTAPE FP-53 is highly resistant to water, solvents, oil and abrasion . . . adheres instantly . . . strips clean without staining!

SHURTAPE® FP-53

Write for free sample

Verify SHURTAPE FP-53 as a protective tape in your production!

CLOTHES LINES • TWINES
PRESSURE-SENSITIVE PAPER TAPES
SASH CORDS • WEATHER STRIPPING
COTTON & RAYON YARNS • EXTRUDED PLASTICS

Shuford Mills, INC. SINCE 1880
HICKORY, N. C.

World's Largest Manufacturer of Cotton Cordage

3285

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Specify the No. 20-RD

A Sisal Finger-Buff* by Churchill

FASTER cutting action!

LONGER wearing qualities!

REMARKABLY smoother finish!

FLEXIBILITY never before achieved in a sisal buff!

The No. 20-RD illustrated produces exceptional results on stainless.

Churchill No. 20-RD Sisal Finger-Buffs* are competitively priced. Produced in all sizes from 3" to 21" diameters. Write for complete information.

Write us your problem

Solving "every-day" and "specialized" buffing problems has been Churchill's ***only*** business for 21 years. Originator of the Finger-Buff*, Churchill has developed and carries in stock a Churchill Finger-Buff* for nearly every buffing, polishing and coloring operation.

**The trade's attention is called to United States Patent No. 2,724,937, issued November 29, 1955, to George R. Churchill covering the cloth-covered sisal buffing wheel manufactured by George R. Churchill Company, of Hingham, Massachusetts, exclusive licensee, and marketed under its trade-mark, "FINGER-BUFFS", Reg. U. S. Pat. Off.*

**Churchill Finger-Buff, T.M. Reg. U.S. Pat. Off.*

REPRESENTATIVES IN PRINCIPAL CITIES

Geo. R. Churchill Co., Inc.

Dept. PF-128, Hingham, Mass.

For more data circle 354 on Postpaid Card

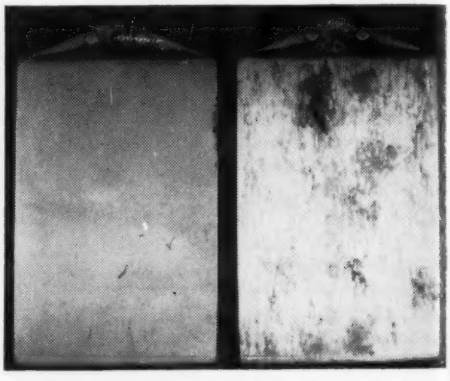
320-grit abrasive to achieve uniform brightness of the desired lustre.

2. Parts are immersed in an alkaline cleaner for three to 10 minutes, then given a cold-water rinse.

3. Parts are immersed in the anodizing bath for less than one minute, then given a cold-water rinse and a hot-water rinse.

4. When parts are dry, lacquer or varnish is sprayed on and baked dry (typical time and temperature: 20 minutes at 250 deg. F.). Certain lacquers and varnishes can be air dried.

In 20 per cent salt-spray tests, magnesium finished with clear anodize plus lacquer or varnish has passed 500 hours with virtually no change in appearance, Dow said.



Test panels of magnesium finished with clear anodize plus varnish (left) and varnish over bare metal (right) are compared after spending 510 hours in 25 per cent salt spray.

The anodic treatment can be applied to all forms of magnesium: sheet, extrusions, die castings, sand castings and forgings.

Developer: Dow Chemical Co., Midland, Mich.

For more data circle 13 on Reader Service Card

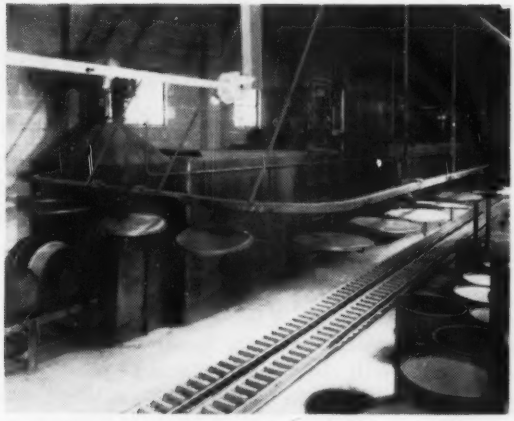
To page 114→

"DRUMMING"

up a faster output of quality, finish-baked steel drums & covers in a CONVEYORIZED OVEN

lanly

If your manufacturing operations involve the application and drying or baking of a product finish, you're on solid ground when you consult LANLY regarding your oven or dryer requirements.



Typical of all Lanly installations, this oven exemplifies coordinated mechanization with low cost efficient drying action.

LANLY welcomes a discussion of your drying and baking operation problems. Write for Catalog No. 560 and get better acquainted with our organization.

Central and South American Representative; Interkiln De Mexico S. A. Mexico 4, D. F.

Find Your Representative In The Yellow Pages

THE lanly CO.

FINISHING OVENS

2800 Euclid Avenue • Cleveland 15, Ohio

Atlanta, Georgia • Birmingham, Ala. • Boston, Mass. • Chicago, Ill. • Cleveland, Ohio
Columbia, So. Carolina • Columbus, Ohio • Detroit, Mich. • Houston, Texas
Pittsburgh, Pa. • Rochester, N. Y. • San Francisco, Calif. • St. Louis, Mo.

For more data circle 355 on Postpaid Card

Introducing Allied's

IRILAC™

#1000

New, Clear Protective Coating for All Metals . . . As Safe and Easy to Handle as Water!

New Method of protection incorporates corrosion inhibitors in a water-soluble polymer base. Dries to an extremely thin, tough, durable coating—clear in color. Does not chemically affect base metal or any post treatments. Used as a protective treatment alone or to enhance value of post treatments.

Allied's new Irilac #1000 is a concentrated solution of a water-soluble polymer with built-in complex corrosion inhibiting materials. It was developed to answer the needs of the metalworking industry for a non-conversion process that will provide corrosion resistance and resistance to fingerprinting and abrasion on base metals, and electrochemically or chemically finished surfaces—without changing the appearance of the metallic surface.

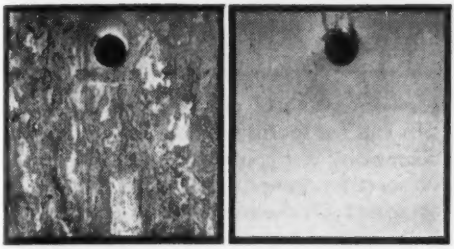
There are no hazards involved—Irilac is non-fuming, non-toxic, and requires no special fire prevention measures.

THE PROCESS

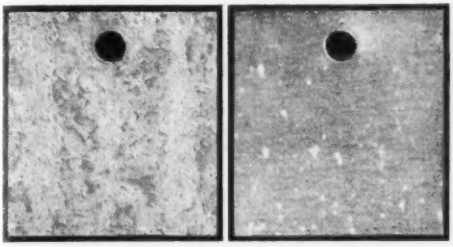
Irilac #1000 is diluted with water to provide a simple one-pass working solution. It is then applied by dip, brush or spray and forms a coating that quickly *bonds* to the metal surface without reacting with the surface.

THE PROPERTIES

The resulting coating is clear, transparent, thin yet durable. It has excellent water resistant properties, and can be rubbed, handled and subjected to rough treatment. The surface to which Irilac has been applied is not altered—in fact, the transparent coating brings full tone to colored surfaces and clarity to iridescent surfaces. The water-thin physical characteristic of the solution means that the coating provides protection in recessed areas that are difficult, if not impossible, to protect with other methods.



STEEL PANELS: bare (left) and coated with Irilac (right) after 8-hour salt spray.



ALUMINUM PANELS: bare (left) and coated with Irilac (right) after 168-hour salt spray.

WHERE IRILAC CAN BE USED

Irilac #1000 can be applied to *any* metal—wet or dry—treated or untreated. All metals can be processed in *one* operation in the same solution. It can be applied in conjunction with any process—over Iridite, anodized, phosphated surfaces, black oxide, etc. Surfaces treated with Irilac provide a good base for paint.

APPLICATION ADVANTAGES

No other process or material available for the protection of metals offers all the application advantages found in new Irilac #1000.

1. It can be applied to *any* clean metal simply by dip, brush or spray. No special equipment is required.
2. Saves time — just apply and dry — no reaction time required.
3. No hazards involved—no exhaust or special fire protection equipment is required. Irilac is non-fuming and non-toxic.
4. Saves space. Presents no disposal problem. Low in first and final costs.

Because of its versatility and complete safety, Irilac has unlimited uses. For example, it will protect aluminum furniture, brass hardware and fixtures, steel parts of all types, zinc castings, etc. In fact, any base metal or plated surface, or those treated with electrolytic or chemical post-treatments, can be improved or enhanced with Irilac.

IRILAC #1000 MAY BE THE ANSWER TO YOUR PROTECTION PROBLEM **Our development staff will be glad to work with you to determine the significant benefits Irilac can offer you. Simply send us some parts and let us show you what Irilac can do. No obligation, of course.**

Allied Research Products, Inc.

4004-06 EAST MONUMENT STREET
BALTIMORE 5, MARYLAND

***Manufacturers* of IRIDITE®, IRILAC™, ARP® Brighteners and Plating Chemicals — West Coast Licensee: L. H. Butcher Co.**

For more data circle 356 on Postpaid Card

Head start for industrial finishes

Every step toward faster, safer, more effective metal cleaning heads a company in the direction of extra profit. In the competitive race for higher quality products, produced faster, the company that crosses the "finish line" first is the one that gets a healthy start by keeping abreast of the latest developments in the industry. This series of chemical news reports will keep you posted on what's new in the chemistry of metal cleaning.

Formulators shave costs with sodium orthosilicate

Alert formulators are saving freight dollars on Dow's S.O.S. containing less than one molecule of water of hydration. And the open-head Dow drum rides better in transit, saves floor space in shipping and storage.

Because it contains less than one molecule of water of hydration, Dow S.O.S. saves formulators freight costs on every drum. The almost complete absence of water means that freight dollars are spent on S.O.S. — not on unnecessary water.

High acid capacity and high pH of Dow S.O.S. give top cleaning action. Oils, fats and waxes disappear from metal like magic when exposed to the cleaning action of this efficient alkali. Experienced formulators depend on Dow S.O.S. and Caustic Soda to make their metal cleaning compounds the best on the market.

Formulators get another bonus in Dow alkalies—the improved open-head drum. It practically eliminates the headache of freight claims and loss from shipping damage. And formulators find many uses in their business for these smooth-riding, damage-free drums.

The Dow full open-head steel alkali drum takes up almost a full square foot less floor space than conventional drums and has a longer bearing surface which eliminates "climbing" of drums in shipment.

These advantages put Dow's formulator customers in a better competitive position . . . enable them to give *their* customers the best alkali cleaning compounds.

A basic producer of alkali for top quality metal cleaning compounds, Dow is constantly at work improving not only product quality but packaging. "Just to be sure," as one Dow product manager put it, "that the formulators who want the best come to us."

DOWANOL:

Passes "acid test" in rust removers

Metal cleaners who use a hot bath (170°F.) of phosphoric acid type rust removers are switching to Dowanol® TPM for their glycol ether solvent.

Dowanol TPM (tripropylene glycol methyl ether) gives better solubilizing

Formulators use Dow Alkalies to make topnotch metal cleaning compounds.

and penetrating characteristics and, because of its high boiling point (238°C.), does not readily evaporate under extremely high bath temperatures.

In brush and spray rust removal operations, as well as dip baths, Dowanol TPM is helping phosphoric acid removers do a better job at lower cost.

Dowanol TPM is only one of the Dowanol family of glycol ether solvents made by Dow (only company which makes both an ethylene and propylene series). Producer of the widest line of glycol ether solvents available, Dow is in a position to furnish extensive technical information on these products for metal cleaning operations.

CHLOROTHENE: ***Puts more solvent power, more safety into cold cleaning***

Maintenance cleaning of metal parts calls for a solvent with top cleaning power, maximum safety and little or no residue. And Chlorothene® (Dow 1,1,1-trichloroethane, inhibited) fills the bill.

Plant maintenance men are using this new solvent to get better, safer cleaning in dip, spray and wipe applications. They're cleaning everything from nuts and bolts to big machine tools.

Many plants switched to Chlorothene because management was sensitive to safety factors. But once in use, Chlorothene proved itself as a top-performing cleaner, made other cleaners just plain out of date.

Because it is low in toxicity and has no flash or fire point (flammability characteristics similar to trichloroethylene), Chlorothene is quickly catching on for production cleaning as well as maintenance cleaning operations.

★ ★ ★ ★

For more information on any of the chemicals discussed in this advertisement write THE DOW CHEMICAL COMPANY, *Midland, Michigan, Chemicals Sales Department 763G-1.*

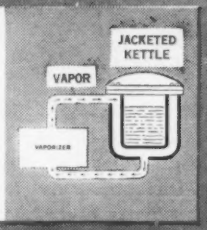
MORE GOOD NEWS
for the metalworking industry

Orthodichlorobenzene

. . . Tops for removal of soft carbon deposits as well as oils and tars. Cost savings possible with water-soluble emulsions—formulations available on request.

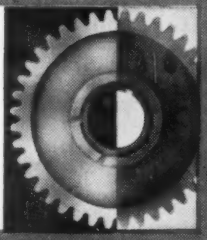
Dowtherm®

. . . Safer, organic heat-transfer medium for operations ranging from 300° F. to 750° F. Minimizes fire hazards, permits more economical, pinpoint heat control, with little pressure!



Trichloroethylene

. . . Now NEU-TRI* (recently added neutral grade) gives Dow customers a full line of solvents to choose from for top efficiency in vapor degreasing.



Dowicide® A

. . . Preservative keeps cutting oils "fresh" and odor-free by preventing growth of bacteria and mold. Makes oil last up to three times as long.

Dow chemicals basic to the metalworking industry

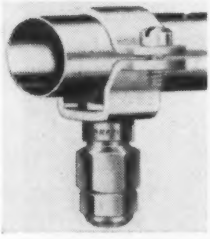
Chlorinated Solvents • Brominated Aliphatics
Alkalies • Ion Exchange Resins • Glycol Ethers
Preservatives • Hydrochloric Acid • Phenolsulfonic Acid • Ammonia • Industrial Glycols
Polyethylene Glycols • Polypropylene Glycols

YOU CAN DEPEND ON

DOW

For more data circle 357 on Postpaid Card

Connectors for Spray Nozzles



Split-Eyelet Connector

Description: Designed for liquid, gas and air lines and for pressures up to 250 p.s.i., Spraying Systems Split-Eyelet Connectors provide leakproof connection and simplified mounting of ⅛ and ¼-inch spray nozzles of all types. These connectors are supplied in clamp sizes to fit ½, ¾ and 1-inch pipe and 13/16, ⅞, 1, 1-1/16, 1¼ and 1⅜-inch O. D. tubing. Equipment such as gages or hose may also be mounted to lines with these connectors.

In this Split-Eyelet design, the body unit is separate from the clamp member and liquids or gases come only in contact with the body. As a result the body can be offered in metals most compatible with the liquid or gas handled. This is of particular impor-

Spray Nozzles

Pneumatic Atomizing Nozzles

Gauges

Air Hose

Typical Applications: Split-Eyelet Connectors

for the "Solution to your Plating Problems" .... come to

JELCO

BRASS ADDITIVE . . . *can be used in standard & high speed formulations — still & barrel plating*

One of America's leading manufacturers
- BRASS Additive
- COP-BRITE
- BARREL COPPER Brightener
- BARREL NICKEL Brightener

- Increases efficiency and throwing power
- Produces brighter and faster plating
- Allows use of a higher current density
- Retards anode polarization
- Eliminates cyanide and ammonia fumes

A Proven Process!

Used successfully by job platers and manufacturers

Non-Critical
Boosts Production
Cuts Rejects

For technical information, complete details and prices . . . write to

JELCO Finishing Equipment Corp.
153 East 26th Street, New York 10 • Phone LExington 2-3055

For more data circle 358 on Postpaid Card

NOW!!

SINTABUR*
SINTABRITE
SINTAHONE
SINTACUT
SINTACOTE

Scientifically-designed sintered-metal
TUMBLING SHAPES

(*TM. Reg. U.S. Pat. Off. & Pat. Pend.)

Here is an entirely new type of tumbling media with unique advantages for deburring, grinding, burnishing, and dry lubricant coating. These new media are produced by an exclusive Dixon Sintaloy process which permits low-cost, mass production of shapes with characteristics scientifically controlled for barrel finishing requirements.

Exceptionally long life — plus added savings in shorter work cycles, reduced labor and prolonged life with repeated re-use.

Non-clogging — non-powdering — precise shape, uniformity and great durability minimize clogging, jamming, charging or discoloring work.

Greater efficiency — more uniform results — the ideal media for the job means faster more efficient cutting, more uniform finished parts.

Simpler standardized operation — no compensating for wear during runs — speeds, simplifies and saves labor and assures higher work quality.

Write or wire direct to factory for full data.

DIXON SINTALOY INC.

a subsidiary of The Joseph Dixon Crucible Company
537 Hope Street, Stamford, Connecticut

For more data circle 359 on Postpaid Card

tance where corrosive materials are involved. The clamp member is steel or stainless steel for leverage and thread strength under compression.

For complete information write the manufacturer for No. 7521 Split-Eyelet Connector Bulletin No. 93.

Manufacturer: Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

For more data circle **14** on Reader Service Card

Pressure and Temperature Controllers

Redesigned Powers Automator Series 200 pressure and temperature controllers are made with cartridge components, use a minimum of compressed air, are easier to read.

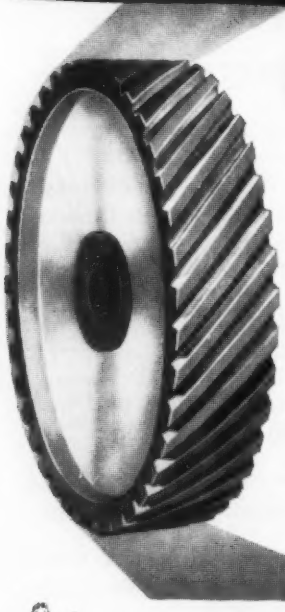
The controllers are used with diaphragm-operated valves for gradual, accurate regulation of temperature or pressure. Changes in the process under control are sensed by a remote nitrogen-filled bulb connected by a capillary to the controller. These changes are relayed by the controller to the valve, which modulates the heating, cooling or pressure medium to keep the process at the desired point.

The instruments are one-third thinner and 57 per cent smaller, permitting more compact surface or flush mounting.

Air consumption of the instrument with a stable valve position is 25 cubic inches of free air per minute. Lower consumption reduces compressor operating costs and the chance of foreign particles clogging the instrument.

NOW a SELF-ALIGNING

Contact Wheel



NEW **R-57** *Eliminates* **VIBRATION RUNS SMOOTHER**

Automatically aligns. Rubber Arbor Hole Hub draws up tightly on spindle even when worn spindles are used . . . Eliminates Vibration . . . Low Operating Noise . . . Maximum efficiency.

ADDED R-57 FEATURES:

Lightweight, maximum safety. Plain or serrated faces in all durometers, for every grinding and finishing operation.

Write today for information and prices.

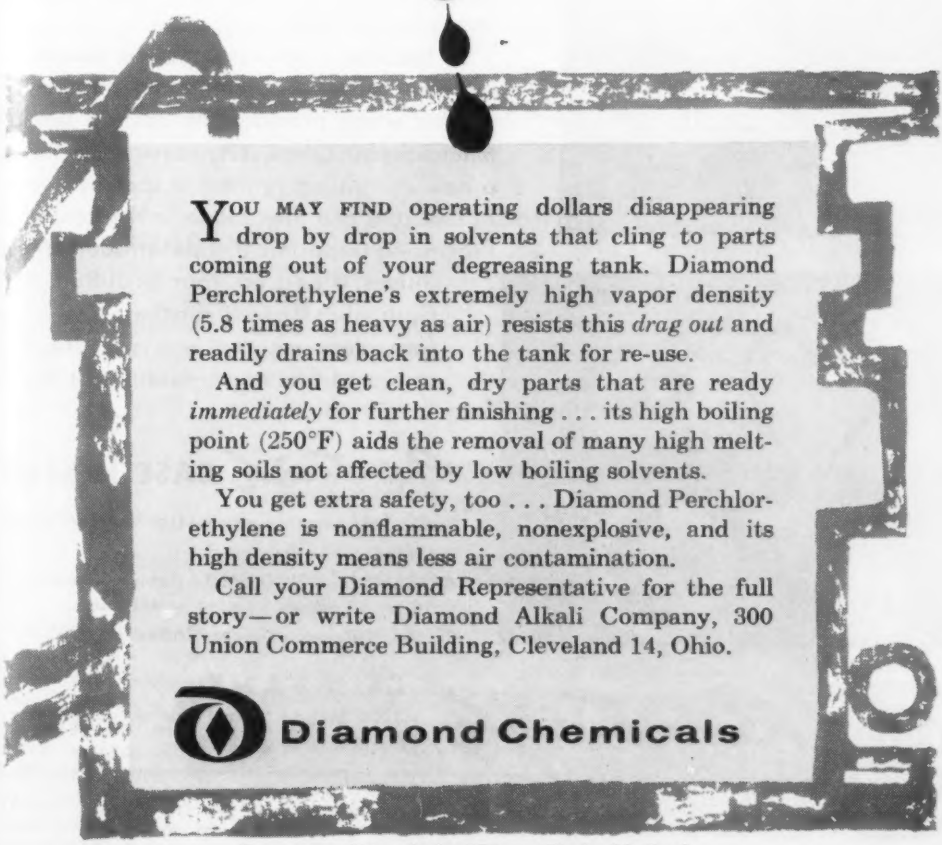
CHICAGO RUBBER COMPANY, INC.

651 Market Street • Waukegan, Illinois

For more data circle 360 on Postpaid Card

is your degreasing solvent suffering from

DOLLAR "DRAG OUT" ?



YOU MAY FIND operating dollars disappearing drop by drop in solvents that cling to parts coming out of your degreasing tank. Diamond Perchlorethylene's extremely high vapor density (5.8 times as heavy as air) resists this *drag out* and readily drains back into the tank for re-use.

And you get clean, dry parts that are ready *immediately* for further finishing . . . its high boiling point (250°F) aids the removal of many high melting soils not affected by low boiling solvents.

You get extra safety, too . . . Diamond Perchlorethylene is nonflammable, nonexplosive, and its high density means less air contamination.

Call your Diamond Representative for the full story—or write Diamond Alkali Company, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

For more data circle 361 on Postpaid Card

consult the..... *Roto-Finish*

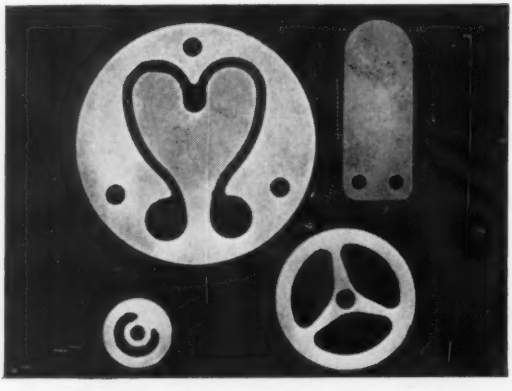
CUSTOMER'S MAN

FOR FINISHING PLUS + RESEARCH and TECHNICAL ASSISTANCE

Faced with the problem of cutting down finishing costs with no sacrifice in product quality, more and more production and management men are turning to Roto-Finish for complete finishing *service*.

In the Roto-Finish Laboratory, technicians analyze your problem to determine the process which provides the desired finish at minimum cost. Often, it is necessary *to develop a new compound* to meet a specific need.

Test runs are then made in the Roto-Finish Processing Department under production conditions. If desired, your local Roto-Finish Customer's Man will run these tests in your own plant; so that you can check the results at first hand, results like this . . .



Roto-Finish CASE HISTORY

PART: Refrigeration compressor flapper valves.
MATERIAL: Swedish steel.
OPERATIONS PERFORMED: Deburr. Generate full radii on all edges. Remove stress risers.
RESULT: Fatigue resistance increased 500%.

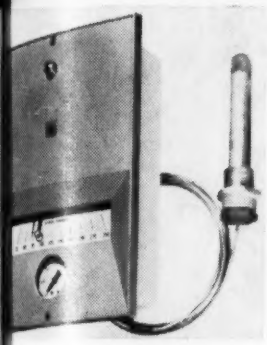
ROTO FINISH®

Roto-Finish **COMPANY**
3704 Milham Road, Kalamazoo, Michigan
Phone: Fireside 3-5578

FOREIGN REPRESENTATIVES: ARGENTINA—Taller—Buenos Aires ● AUSTRALIA—A. Flavell Ltd.—Cheltenham ● BRAZIL—Commercial E. Industrial de Fornos Werco, Ltd.—Rio de Janeiro ● CANADA—Canadian Hanson & Van Winkle Co., Ltd. —Toronto ● ENGLAND—Roto-Finish Ltd. — Hemel Hempstead ● FRANCE—Societe Roto-Finish—Paris ● GERMANY. AUSTRIA, NORWAY, SWEDEN, SWITZERLAND—Metallgesellschaft A. G.—Frankfurt, a. M.—Germany ● HOLLAND, BELGIUM, LUXEMBURG—N. V. Roto Finish Maatschappij—Delft, Holland ● ITALY—Societa Roto-Finish a R. L.—Milan ● SPAIN—Instituto Electroquimico, S. A.—Barcelona

For more data circle 362 on Postpaid Card

If the pilot valve becomes clogged, the operator presses the restriction cleaner to clear the line and keep the instrument in service.



Temperature Controller

Both the restriction cleaner and pilot valve filter are in cartridge form for easy replacement. The thermal spiral is also easily removed and replaced.

Temperature range: For finishing use, range is 25 to 200 deg. F. with polyvinyl chloride covered bulb and 15 feet of capillary. Averaging bulbs, stainless steel and copper wells are available.

Manufacturer: Powers Regulator Co., 3434 Oakton St., Skokie, Ill.

For more data circle **15** on Reader Service Card

★ ★ ★

Valve Washers

Description: Two parts washers recently built by the C. A. Dauer Co. for Ford Motor Company's Equipment and Material Handling Section, Engine and Foundry Division, are designed especially for cleaning and removing moisture from valve surfaces after grinding and before aluminizing. One of the washers is designed to handle steel intake valves, the other is for cast austenitic steel exhaust valves. Each cleans 2400 valves per hour.

Valves are transported on monorail conveyors with magnesium alloy carriers that have attachments spaced apart from one another. Each carrier is designed for three tiers of valves—a maximum of 23 valves—in vertical position, with the valve head up.

Washer Cycle: Each washer is a double-pass machine, with entrance vestibule, hot-alkali wash section, hot water rinse section, drain and exit vestibule, washer gap and blow-off section. Overall dimensions of each washer: 32 feet long, eight feet wide, seven and one half feet high.

Manufacturer: C. A. Dauer Co., Inc., 14380 Ilene Ave., Detroit 38, Mich.

For more data circle **16** on Reader Service Card

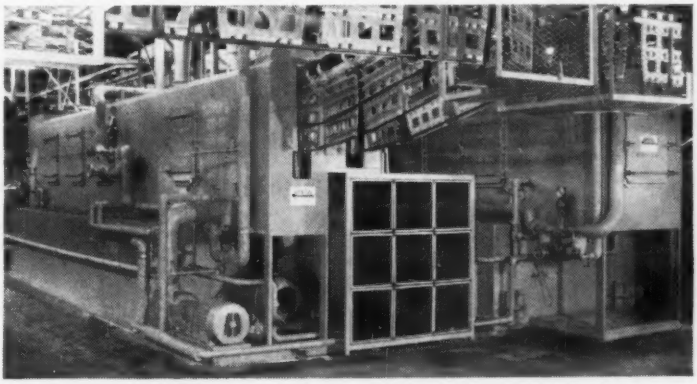
★ ★ ★

Golden Chromate

Heatbath Corporation has introduced a powdered chromate that is used to make up solutions for producing an iridescent golden coating on zinc and cadmium plates and zinc die castings.

Two to four ounces of the Duracoat H-6-2 concentrate per gallon of water

★ ★ ★



Two washers made especially to clean automobile engine valves. Exit and entrance to exhaust-valve washer is at left, turn-around end of intake-valve washer at right.

are needed to make up the solution, which requires no separate additions of liquid acids for make up or replenishment.

The film produced by this material is corrosion resistant, serves as an excellent base for paint.

Solutions are easily controlled, the manufacturer states.

Manufacturer: Heatbath Corp., Springfield 1, Mass.

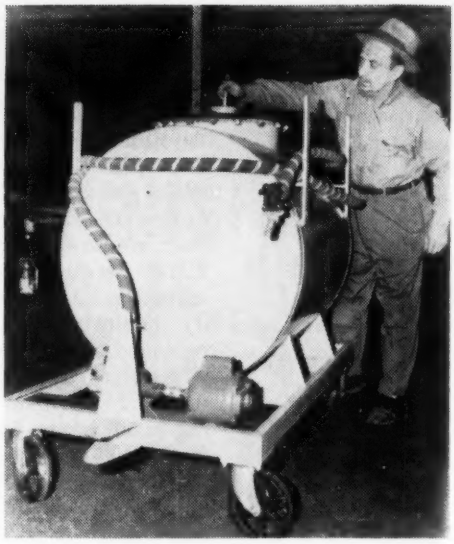
For more data circle **17** on Reader Service Card

★ ★ ★

Portable Acid-Handling Unit

An acid-transportation buggy with acid-proof accessories is now being marketed by Perma-Line Rubber Products Corp.

This unit is a steel tank lined with rubber 3/16-inch thick. A 35-g.p.m. all-rubber centrifugal pump with carbon seal and an acid-proof rubber hose are provided.



Perma-Line Acid-Transportation Buggy

Manufacturer: Perma-Line Rubber Products Corp., 1753 N. Winnebago Ave., Chicago 48, Ill.

For more data circle **18** on Reader Service Card

★ ★ ★

Pint-Sized Plating Department

A utility table manufactured by Dalic Metachemical Ltd. holds the necessary selective plating equipment

Aerosol TOUCH-UP PAINT

TO MATCH YOUR EQUIPMENT

Self spray enamels, lacquers, stains and hammer finishes packaged to match your equipment. Excellent for field or production line touch-up. Packaged with your label. Write for details.

PLASTI-KOTE, INC.

9801 Harvard Ave., Cleveland 5, Ohio

For more data circle 363 on Postpaid Card

YOUNG BROTHERS *Baking and Drying* **OVENS**

designed and built for every product and process requirement

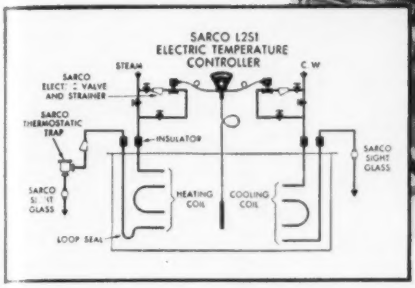
Batch and Conveyor types up to 1000° F.

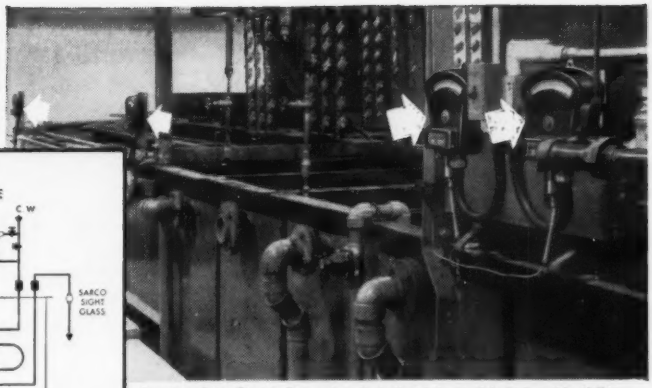
Write for Bulletin 157

YOUNG BROTHERS CO. 1830 Columbus Road Cleveland 13, Ohio

Over 60 years of service

For more data circle 364 on Postpaid Card





Seventeen Sarco Electric Temperature Controllers help maintain high quality plating—cut costs—at Ronson Corporation, Delaware Water Gap, Pa. Controllers are used on chrome, nickel, copper, silver, and gold plating tanks. This is a repeat installation.

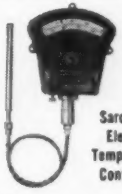
Improve plating quality—cut your costs with low-cost temperature control

Unstable bath temperatures . . . the result of erratic manual temperature control . . . are sure to lead to costly rejects, wasted man-hours and breakdown of plating solutions.

You can solve these problems at *low cost* . . . by installing always-reliable Sarco Automatic Temperature Control. Just think . . . a complete Sarco System is yours for as little as $130 a tank!

1. **You improve plating quality** because creeping temperatures are a thing of the past.
2. **You lower rejects** because solutions are held automatically to pre-set temperatures. No chance for human error to mess up a tankload . . . and cut into profits.
3. **You get better utilization of time** —platers are able to concentrate on their plating work. No worrying about bath temperatures. No turning on and off of valves.
4. **You save plating solutions** — because automatic control prevents boil-off caused by overshooting temperature.

Write for Bulletin 1025-B or consult your plating supplies jobber. Sarco Company, Inc., 635 Madison Avenue New York 22, N. Y.



Sarco LSI Electric Temperature Controller

A COMPLETE SYSTEM FOR AS LITTLE AS $130 A TANK!

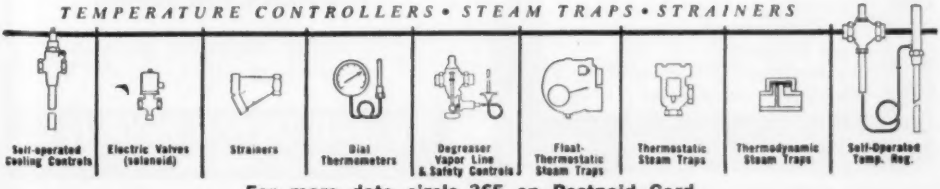
Think of it . . . automatic temperature control that often pays for itself in weeks!

Easy-to-read controller dial clearly indicates temperature being maintained. Temperature setting quickly changed by turning one knob.

2224-B

SARCO *improves product quality and output*

TEMPERATURE CONTROLLERS • STEAM TRAPS • STRAINERS



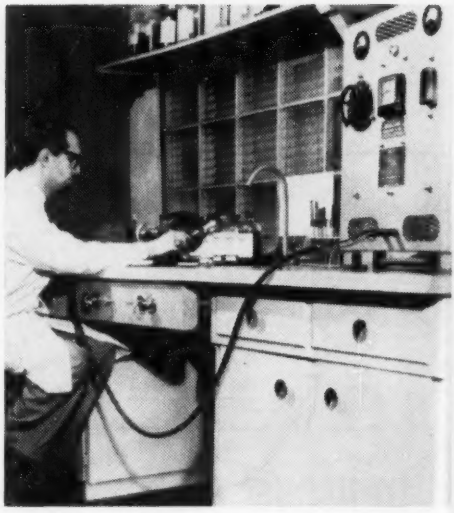
Self-operated Cooling Controls | Electric Valves (solenoid) | Strainers | Dial Thermometers | Degreaser Vapor Line & Safety Controls | Float-Thermostatic Steam Traps | Thermostatic Steam Traps | Thermodynamic Steam Traps | Self-Operated Temp. Reg.

For more data circle 365 on Postpaid Card

and materials for depositing almost any metal on any other.

Because only small amounts of electrolyte are required, one-liter bottles containing metallo-organic complexes of many different metals may be kept on hand. All these plating solutions, styluses, and other accessories can be stored in the table's drawers and cabinets.

Dalic plating is useful for depositing almost any metal on localized areas, without extensive masking or stopping off. Such a selective plating department can be used to build up overmachined parts to correct dimensions; ensure precision fits between bearings and housings; protect local areas during carburizing or hardening; simplify soldering on aluminum; improve wear resistance; and reduce arcing.



Dalic Utility Table: a pint-sized plating department that's useful for localized plating

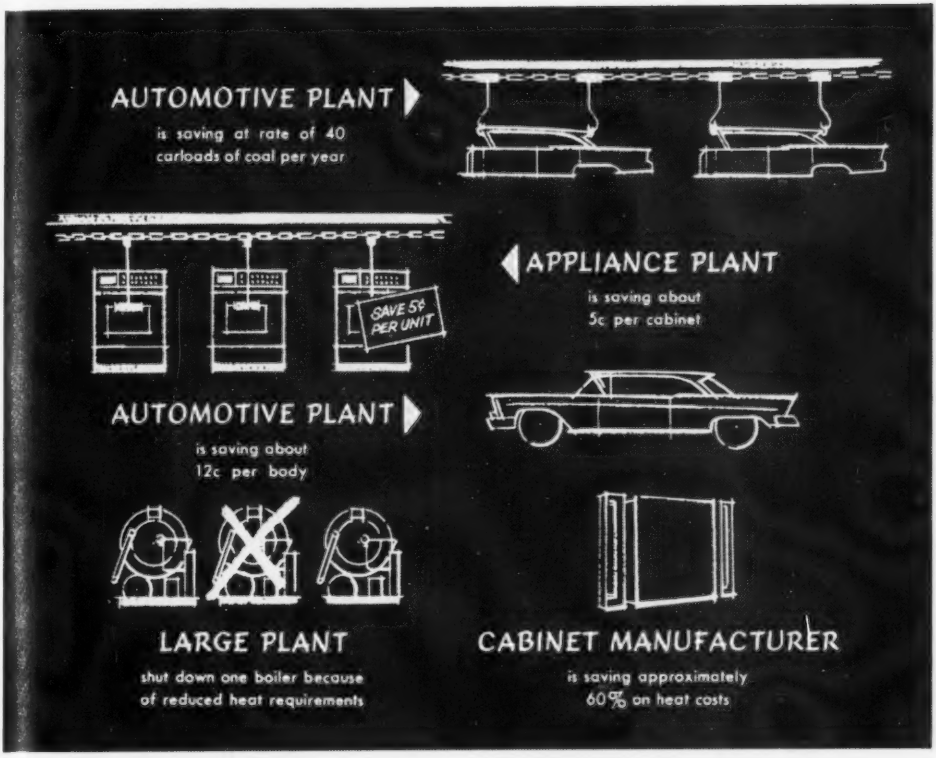
A rectifier with half-cycle cut-off to prevent arcing supplies low-voltage direct current. The cathode lead is

BRADY V-GROOVE
TAPEMATIC
automatic mask, label and tape dispenser
• Dispenses any pressure-sensitive masking tape at cost-cutting speeds.
• Dispenses different sizes and shapes of printed or unprinted masks from the same roll.
• Dispenses all masks at the operator's speed of application.
Special requirements? Brady manufactures Quik-Masks in any size and shape you specify.
For details and a demonstration in your plant or office, write:
71A
W. H. BRADY CO.
EST. 1914
746 W. Glendale Avenue
Milwaukee 9, Wisconsin

For more data circle 366 on Postpaid Card

TRUE BRITE
BRASS SOLUTION
A foolproof solution which has been in use for over 6 years in light and heavy production.
• Ready To Use—Just Add Water
• No Variance in Color
• Trouble-Free—Little Supervision Needed
• Low Cost—Additions only once a day
Available in a variety of colors. Will match your sample.
Write for technical bulletin and prices.
TRUE BRITE CHEMICAL PRODUCTS CO.
Box 31, Oakville, Conn.

For more data circle 367 on Postpaid Card


AUTOMOTIVE PLANT
is saving at rate of 40 carloads of coal per year
APPLIANCE PLANT
is saving about 5c per cabinet
SAVE 5¢ PER UNIT
AUTOMOTIVE PLANT
is saving about 12c per body
LARGE PLANT
shut down one boiler because of reduced heat requirements
CABINET MANUFACTURER
is saving approximately 60% on heat costs

high quality coatings... spectacular savings, too! New COLD BONDERITE SYSTEM

These are not isolated cases. Everyone saves when they change from conventional hot phosphating to the new Cold Bonderite System!

The difference is in heat required. Cleaner, rinse and Bonderite operate at 40° to 75° cooler than in conventional installations.

Results produced by the Cold Bonderite System equal the highest Bonderite quality standards. Chemical costs are comparable to hot systems.

Many plants, from the largest on down, have changed to the Cold Bonderite System in their finishing lines. They've cut costs drastically. You can, too. Write or call today!

PARKER RUST PROOF COMPANY
2172 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE	BONDERITE and BONDERLUBE	PARCO COMPOUND	PARCO LUBRITE	TROPICAL
corrosion resistant paint base	aids in cold forming of metals	rust resistant	wear resistant for friction surfaces	heavy duty maintenance paints since 1883

Since 1914— leader in the field

Bonderite, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

For more data circle 368 on Postpaid Card

clamped to the work-piece, the anode lead is fitted with a cotton-wrapped stylus. After dipping in the appropriate electrolyte, the stylus is lightly rubbed over the surface to be plated.

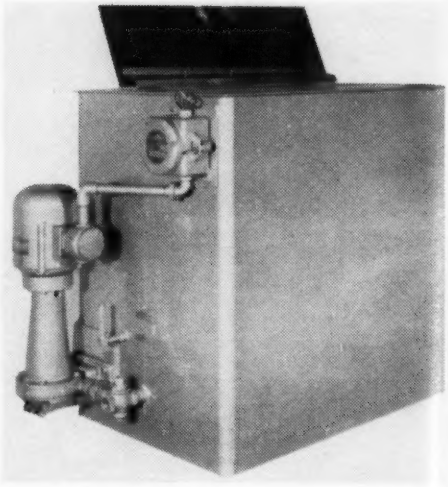
Manufacturer: Dalic Metachemical Ltd., 320 Fifth Ave., New York 1, New York.

For more data circle **19** on Reader Service Card

★ ★ ★

Mask Washer

Description: Mask-washing machine Model W 4200 designed by Conforming Matrix Corporation for the cleaning of large masks is useful for cleaning masks up to 42 inches in length, such as those used in producing refrigerator and automotive trim, steering wheels, large toys such as hobby horses, advertising displays, outboard motor shrouds, and multiple-opening masks.



Mask Washer: for cleaning large masks

Features: Splash-proof lid, visual fluid-level gage, adjustable mask suspension, pump intake strainer; no pump seals required.

Requires 50 gallons of solvent for efficient operation. Non-clogging nozzles spray against both sides of the masks simultaneously to clean small openings and delicate bridging and edges without damage.

Manufacturer: Conforming Matrix Corporation, 356 Toledo Factories Bldg., Toledo 2, Ohio.

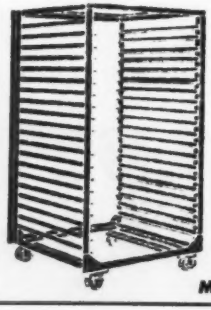
For more data circle **20** on Reader Service Card

"GRIPALLOY"

. . . Attractive satin sheen ETCHING PRIMER in black and colors . . . Often used as finish coat . . . Air dries in minutes . . .
. . . Amazing tight adhesion to 25 different metals as reported by a large electrical manufacturer.
. . . Excellent resistance to Salt Spray, Gasoline, and Solvents . . .

TENAX, Newark, N. J.
Lacquers—Enamels
Synthetics—Vinyls

For more data circle 369 on Postpaid Card



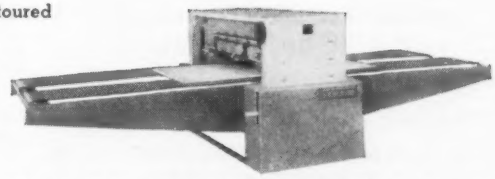
USE WILDER RACK TRUCKS
FOR
INCREASED PRODUCTION
AND
GREATER OVEN CAPACITY
Write for further information.
WILDER MFG. CO., INC.
DEPT. H
MECHANIC ST. & ERIE R.R., PORT JERVIS, N. Y.

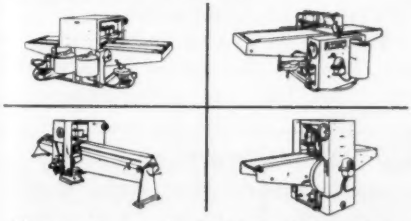
For more data circle 370 on Postpaid Card

Like a Magic Carpet...

your products sail through the Steinemann Pressure Curtain Coater

Fast, flawless finishing for flat and contoured products is attained with speed and precision. Uniform coating is controlled to .5 mils thickness and it spreads to 400 f.p.m. No mist, no waste. Unused finishing material is returned to the reservoir for recirculation.





Twelve Steinemann models come in 5 standard widths 12" to 75", with single or double heads for applying one or two component materials. The Steinemann coater can be operated by unskilled labor. Maintenance and wear are negligible.

Phone, wire or write for further information.

Wood product manufacturers contact

wilco machine works, inc.
Box 3722, Municipal Airport
Memphis, Tennessee

Metal-working industries contact manufacturer

GEORGE **KOCH** SONS, INC.
Evansville 4, Indiana

For more data circle 371 on Postpaid Card

Remote-Cup Spray Outfit

Description: A remote-cup spray outfit recently introduced by DeVilbiss Co. eliminates the need for carrying pressure tanks and lengths of hose when applying limited quantities of material. Since the cup is not attached to the spray gun, spraying in cramped quarters is easier, too.

The unit consists of a one- or two-quart cup with fluid and air-flow control, plus short lengths of hose running to the gun. The gun also has the usual fluid and air controls. The close control of fluid and air pressure possible with this unit makes it easier to produce a sprayed film that flow out well, has little orange peel, goes on with a minimum of "fog."

Color change and clean up are fast and easy, because the hose length from cup to gun is short and the cup has a wide mouth.

DeVilbiss Remote-Cup Spray Painting Unit

Typical Applications: Spray painting grilles, machinery, electrical equipment, furniture and appliances.

Manufacturer: DeVilbiss Co., Toledo 2, Ohio.

For more data circle **21** on Reader Service Card

★ ★ ★

Ultrasonic Cleaner

Description: An ultrasonic cleaning unit recently introduced by Acoustica Associates, Inc., has a five-gallon tank

METALS GLO WITH "TI-CO"

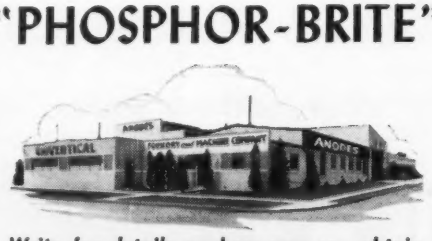
- **COB GRITS (Blasting)**
- **COB FLOUR (Foundry)**
- **COB MEAL (Tumbling)**

Use In Blasting, Tumbling Machine To Remove Burrs, Plastic Flash; Molding Or Core Sand. Will Replace Steel Shot At Much Lower Cost.

TI-CO INDUSTRIES, INC.
P. O. Box 185, Tipton, Indiana
Federal 2-5942, Elwood, Indiana

For more data circle 372 on Postpaid Card

"PHOSPHOR-BRITE"



Write for details on how you can obtain a test supply sufficient to fill one tank.

The New Univertical Rolled Copper Anode for Acid Baths

Prompt shipment from stock in lengths and shapes to suit your requirements.

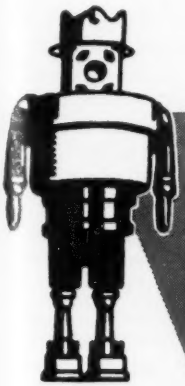
Virgin metals used exclusively

UNIVERTICAL
FOUNDRY AND MACHINE COMPANY
14841 Meyers Rd., BRoadway 3-2000, Detroit 27, Mich.

For more data circle 373 on Postpaid Card

Another plating problem solved by Sel-Rex

"SEL-REX GOLD PLATE ELIMINATED GALLING, INCREASED RESISTANCE TO WEAR OF OUR CONNECTORS."



Cinch
ELECTRONIC COMPONENTS

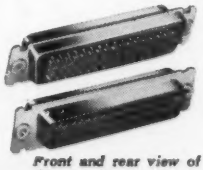
THE PROPOSITION: Research proved that *some* of the metallurgical properties of Gold would improve performance and reliability of new Cinch Connectors.

THE PROBLEM: Ordinary Gold plate's softness makes it susceptible to galling. And, because it is so soft and relatively porous, it wears readily exposing vital contact points to abrasive damage, corrosion — early failure.

THE SOLUTION: After extensive investigation, Cinch installed Sel-Rex Bright Gold because this patented formulation produces electroplate which is:
1) ...twice as hard (115 Vickers, as compared to 65) and has demonstrated 40% greater resistance to wear and abrasion.
2) ...far more dense — accelerated corrosion tests prove Sel-Rex Bright Gold plate gives many times more protection with a fraction of the Gold.
3) ...mirror-bright in any thickness, directly from the bath — no scratch brushing or burnishing. Eliminating such costly post-plating operations makes *net costs* lower too.

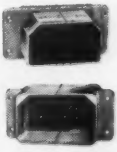
Exclusive Sel-Rex Plating Processes retain the desirable properties of the precious metals — eliminate the problems.

Whatever your plating problems — precious metals, power, equipment or procedures — Sel-Rex representatives are trained to engineer solutions to our mutual profit. Send for FREE technical literature and other case histories and see for yourself... we may have solved your problems last month.



Front and rear view of 50 contact socket D sub-miniature series with floating mounting holes.

15 contact plug and socket D sub-miniature series.



23 contact plug and socket DPX series.

Sel-Rex®

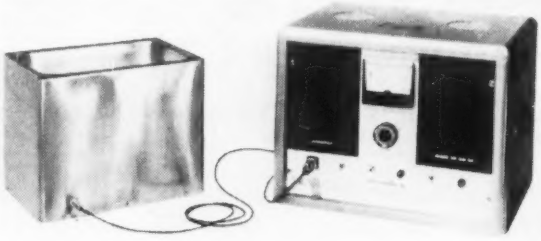
SEL-REX CORPORATION
NUTLEY 10, NEW JERSEY

Manufacturers of Exclusive Precious Metals Processes, Metallic Power Rectifiers, Airborne Power Equipment, Liquid Clarification Filters, Metal Finishing Equipment and Supplies

For more data circle 374 on Postpaid Card

and a powerful (one-kw peak) pulsing generator that is said to produce maximum cavitation and cleaning efficiency.

Specifications: Model DR-250-AH.



Acoustica DR-250-AH Ultrasonic Cleaner

Five-gallon stainless steel tank. Dimensions, 14 inches long, 10 inches wide, 9½ inches deep. 115 volts a.c. Complete details given in Bulletin DR-250-AH, available from the manufacturer.

Manufacturer: Acoustica Associates, Inc., 26 Windsor Ave., Mineola, N. Y.

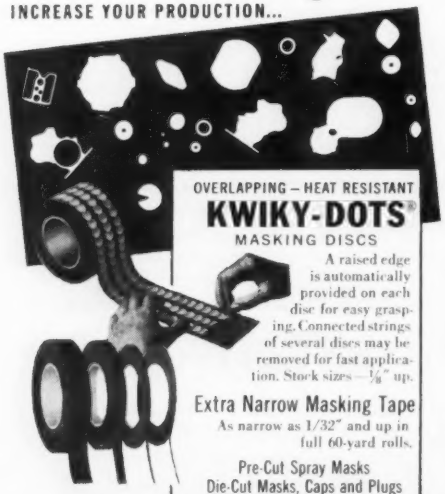
For more data circle **22** on Reader Service Card

Editor's Note:

In the product description of Ni-Plex nickel stripper, mentioned on page 90 of the November issue of PRODUCTS FINISHING, the manufacturer was incorrectly listed as Technic, Inc., Providence, Rhode Island. The manufacturer of Ni-Plex is Hampshire Chemical Corp., Nashua, New Hampshire. Sole United States distribution rights for Ni-Plex are held by Hanson-Van Winkle-Munning Co., Matawan, New Jersey. Technic, Inc., is an authorized sales agency.

Reduce Finishing Cost

INCREASE YOUR PRODUCTION...



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MASKING DISCS

A raised edge is automatically provided on each disc for easy grasping. Connected strings of several discs may be removed for fast application. Stock sizes – ⅛" up.

Extra Narrow Masking Tape

As narrow as 1/32" and up in full 60-yard rolls.

Pre-Cut Spray Masks

Die-Cut Masks, Caps and Plugs

Made to specifications

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Dealers' inquiries invited

IMMEDIATE DELIVERY!

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4314 W. Pico Blvd., Los Angeles 19, Cal.

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Try Us!

We make ACRYLIC, ALKYD, CELLULOSIC and VINYLOID coatings for a very wide range of specialized industrial applications.

The Varnish Products Co.

5204 Harvard Avenue

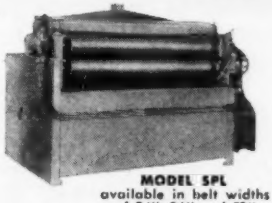
Cleveland, Ohio

For more data circle 376 on Postpaid Card

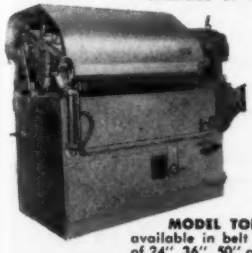
"Only machine capable of handling our rugged and precision sanding requirements on large aluminum panels"*

*Reported by
N. B. Barsha, Plant Engineer
Cupples Products Corp.
St. Louis, Mo.

TIMESAVER
SPEEDBELT
SANDERS



MODEL SPL
available in belt widths of 24", 36" and 50"
Sanding action is for underside of work.



MODEL TOP
available in belt widths of 24", 36", 50" and 54"
Sanding action is overhead.

"We were faced with the problem of sanding 1000 vertical aluminum panels, 28'x24"x3/16" for the exterior of the new U. S. Air Force Academy buildings. These panels required finishing to a uniform and precision surface specification. Before we purchased the Timesaver Model TOP-50, we thoroughly investigated the market for sanding machines of this type. The Timesaver "Speedbelt" was the only unit which possessed the durability, accuracy and rugged construction necessary for our requirements."

The Cupples Products Corporation's experience is typical of Timesaver "Speedbelt" Installations throughout the country . . . where performance and need to achieve production and cut costs is important. They can do all flat metal surface finishing, polishing and sanding formerly assigned to other methods . . . and do them better. What's more, savings made in labor, materials and maintenance soon pay for their low initial cost.

Investigate the advantages of Timesaver Sanders for your plant, write for literature and information today.

TIMESAVER SANDERS

P.O. Box 7446, Robbinsdale Station • Minneapolis 22, Minn.

Pioneers in Wide Belt Sanding for the Woodworking Industry

For more data circle 377 on Postpaid Card

Phosphate Coating

A phosphate coating called Paint-Grip 200 has been introduced by Octagon Process, Inc.

Used on steel and iron products, this material produces a fine-grained coating of insoluble metallic phosphates with low porosity and good adhesion. This film improves corrosion resistance of the base metal and adhesion of paints and coatings.

Lightly soiled products can be cleaned at the same time they are being phosphatized in this material. Heavier soils should be removed in a separate cleaning stage. Paint-Grip 200 can be applied by spray or dip. Coating is produced in 20 seconds to two minutes, depending upon the metal being treated and the method of application.

Manufacturer: Octagon Process, Inc., 15 Bank St., Staten Island 1, New York.

For more data circle **23** on Reader Service Card

★ ★ ★

Fume Suppressor

Description: An addition agent called Proquel C controls mist and spray ordinarily given off during electrolysis of a chromium plating bath, lowers surface tension and raises efficiency of the bath at the same time.

Properties: Proquel C is said to be almost completely stable at temperatures and concentrations normally used for chromium plating. It suppresses fumes, thereby decreasing the health hazard of chromic acid mist. It decreases loss of chromic acid by misting. And it is said to increase throwing power up to 10 per cent.

Manufacturer: Promat Div., Poor & Co., 851 S. Market St., Waukegan, Ill.

For more data circle **24** on Reader Service Card

"HIGHLY RECOMMENDED"

"It was highly recommended to me by a salesman of Udylite Corp. and one of the Smoothex Corp. both of whom are very reliable people. I am therefore enclosing my check," writes new student Ronald Gordon on enrolling for ELECTROPLATING KNOW HOW, the unique home study course. Ten years of experience have proved that no one goes wrong in recommending it! Write Dr. Joseph B. Kushner, Electroplating School, Box 2066, Evansville 14p, Indiana.

For more data circle 378 on Postpaid Card

Editor's Note:

In the article "New Way to Descale Titanium," (Products Finishing, October, P. 42) it was reported that the exclusive licensee of the Temco Process was Delco Chemicals, Inc. Delco was merged into the Pennsalt corporate family in January, 1958. Information concerning the Titanium Descaling Process is available from Pennsalt at its Los Angeles or Philadelphia offices.

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Synthetic Pearl Essence with the natural look!

PEARLESCENT FINISHES BAKE OR AIR DRY FOR

Your Product Made of Metal, Plastic, Wood or Glass.
Write for sample. Specify application and choice of vehicle.

RONA LABORATORIES, INC.

East 21st and East 22nd Sts., Bayonne 4, N. J.
Plants: Maine • New Jersey • Canada

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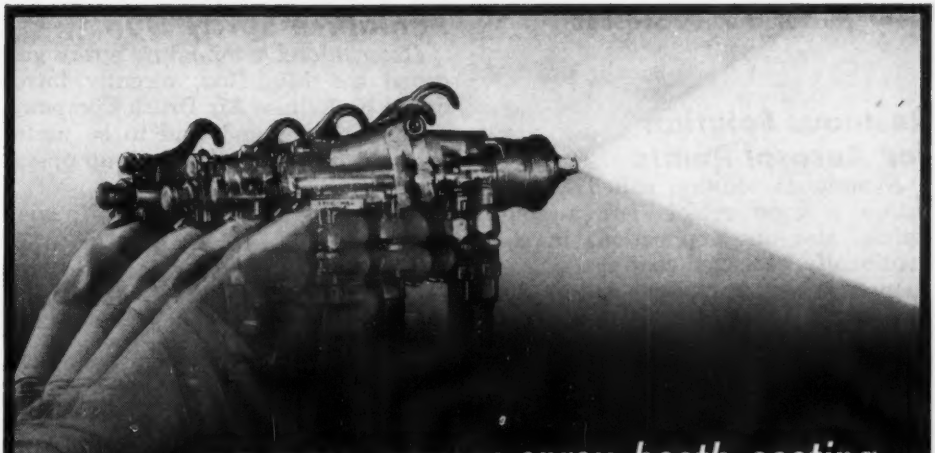


BOOTH-STRIP® spray booth coating covers completely with one pass of the gun

Because a single coat of BOOTH-STRIP is all you need, you get about twice the coverage per gallon, and it takes about half as long to apply. *That means lower labor cost, less down time of spray booth.*

- **BOOTH-STRIP sprays on faster than a square foot per second. Covers entire booth in minutes. *Three-mil coat has tensile strength of 3,000 psi.***
- **Comes ready to spray with standard equipment. No mixing or thinning. Equipment cleans with tap water.**
- **Dries opaque white to improve visibility.**
- **Water-based, completely fire-safe and non-toxic.**

STRIPS OFF EASILY WITHOUT TEARING
Large areas of BOOTH-STRIP peel off readily in one piece from even the most irregular surfaces. Leaves spray booth clean as new.

Start saving money on spray booth housekeeping. Order a trial gallon of BOOTH-STRIP today.

SPRAYLAT CORP.
One Park Avenue, New York 16, N. Y.

For more data circle 380 on Postpaid Card

Resinous Solution for Aerosol Paints

A resinous solution called Darasol makes a good vehicle for aerosol paints, also has applications in conventionally packaged coatings.

In aerosol formulations the product has several advantages: low odor, nonflammability, no tendency to clog valves. It also prevents pigments from settling into solid masses in the container, is exceptionally fast drying, will not run or sag, even in heavy coats.

Laboratory and field tests indicate that the material resists alcohol, salt and acids. Luster, film hardness and resiliency can be varied to suit the application.

Manufacturer of the Vehicle: Diamond Alkali Co., Chlorinated Products Div., 300 Union Commerce Bldg., Cleveland 14, Ohio. The product is distributed by The Kerden Co., P. O. Box 1076, Station A, Cleveland, Ohio.

For more data circle **25** on Reader Service Card

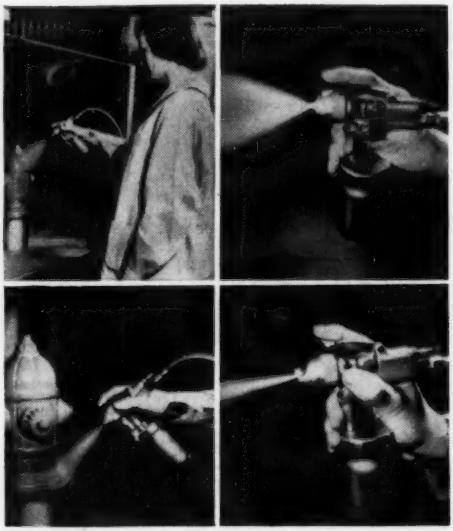
ZINC PLATERS: Purify your cyanide zinc solutions
with
McKeon's **Zinc-Brite**
Regular use keeps zinc solutions clear. Brightens Work.
Write—Phone—Wire Collect for free brochure
Sulphur Products Co., Inc.
McKeon Bldg., 621 W. Pittsburgh St., Greensburg, Pa.

For more data circle 381 on Postpaid Card

Miniature Spray Gun

Description: A miniature spray gun called the Mini-Rod, recently introduced by Eclipse Air Brush Company, is light weight and said to be useful for light finishing and touch-up operations.

The Mini-Rod has a finger-tip snap control which adjusts the spray patterns from cone to wide fan.



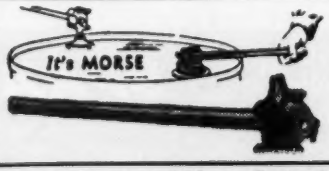
Eclipse Miniature Spray Gun: fast control of spray pattern, handy for small products

Equipped with a four-ounce syphon cup, the gun may also be used from a tank for pressure feed. The plunger is removable and may be adjusted for wear without the use of tools or disturbance of other parts.

Manufacturer: Eclipse Air Brush Co., 381 Park Ave., Newark, N. J.

For more data circle **26** on Reader Service Card

Send NOW for this FIT-ALL
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!
SATISFACTION GUARANTEED..... **$3.80**
Non-sparking type $5.90
Plus Parcel Post
MORSE MFG. CO., Inc.
762 W. Manlius St., E. Syracuse, N.Y.

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If you want a better LACQUER

NIKOLAS

2105 CLEAR LACQUER

FOR THE FINEST PROTECTION OF

- BRASS
- SILVER
- BRONZE
- COPPER

- *you'll have to make it yourself*

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BELLWOOD, ILL.

33 GRAND ST.
BROOKLYN 11, N. Y.

For more data circle 383 on Postpaid Card

News of the Finishing Industry

- company news
- new positions
- new plants
- meetings

NEW PLANTS

DuBois Breaks Ground for New Texas Plant

Construction has begun on a new plant for the Deeps Division of DuBois Co., Inc., Site for the new building is Dallas, Texas.

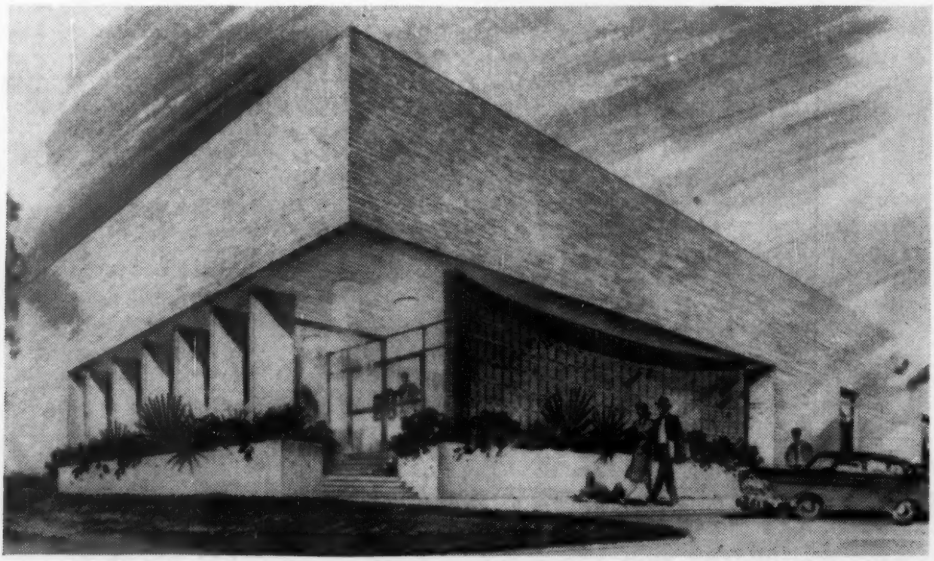
DuBois manufactures and distributes chemical cleaning compounds.

On completion the 30,000-square-foot plant will house sales offices and laboratory, production facilities for most of over 75 DuBois products.

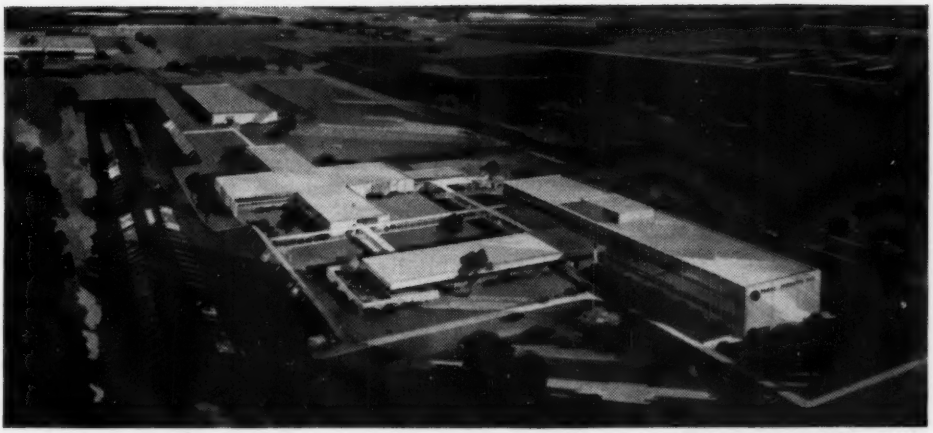
Completion of the Dallas Deeps Division plant is expected by spring.

Turco Building New National Headquarters

Turco Products, Inc., manufacturer of industrial chemical processing compounds, has broken ground in Wilmington, California, 20 miles south of Los Angeles for a 66,000 square foot, million-dollar national headquarters. Scheduled for completion next summer, the new group of buildings includes an Administration Building and Executive Wing, a Research Center and an Engineering Service Building. It will be contiguous to Turco's mod-



Architect's perspective of new plant to be built in Dallas, Texas, by Deeps Div., DuBois Co., Inc.



Architect's conception of new national headquarters being built by Turco Products, Inc.

ern "push-button" manufacturing plant, which was built on the site some three years ago.

COMPANIES

Polymer Corporation Names Commercial Plastics & Supply Distributor in New York Area

Commercial Plastics & Supply Corp. of New York City has been named distributor for nylon products manufactured by the Polymer Corporation of Reading, Pa. Commercial will stock and service the metropolitan New York area, including part of Connecticut and New Jersey.

Dow Now Shipping Chlorine and Caustic Soda From New Louisiana Facilities

First commercial shipments of liquid chlorine and caustic soda were made October 1 from The Dow Chemical Company's new facilities at its Louisiana Division at Plaquemine, on the Mississippi River.

The plants, operating as part of Dow's new chemical complex 10 miles south of Baton Rouge, will provide faster and more convenient service to markets in the southeastern and central states, according to Donald K. Ballman, Dow director of sales.

American Buff Celebrates Anniversary

Leonard B. Sax, president of the American Buff Company, Chicago, recently "passed the buck" to all of the company's employees—23 silver bucks, that is.

Each year every employee "gets the sack" containing the amount of silver dollars corresponding to the number of years the company has been in business. This year is the firm's 23rd anniversary.

Schmieg FINISHING EQUIPMENT
• COMPLETE SYSTEMS
• WASHERS
• BOOTHS
• OVENS
SERVING AMERICAN INDUSTRY FOR MORE THAN A QUARTER OF A CENTURY
Schmieg INDUSTRIES INC.
P.O. BOX 4701
Detroit 34, Michigan
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GRANDPA USED PIPE COILS
But don't blame him. The modern
DEAN.
THERMO-PANEL
COIL
which TAKES THE PLACE of pipe coils, didn't exist. The Dean is far superior for phosphating, degreasing, plating, cleaning, drying, etc. Tell us your heat transfer problems.
Ask for bulletins.
DEAN THERMO-PANEL COIL DIVISION
DEAN PRODUCTS, INC. 622 Franklin Ave
BROOKLYN 38, N. Y. Tel. STerling 9-5400
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Barrel Finishing, Wet Blasting Publication Begun

Techline Finishing Progress is the title of a magazine now being published by Techline Division of the Wheelabrator Corp., Vicksburg, Mich., manufacturer of barrel finishing and wet blasting equipment and supplies.

The new publication is devoted to information on barrel finishing and wet blasting methods.

Volume 1, No. 1, offers pictures and stories about the Techline Division, its products and personnel. Illustrated stories relate details on close-tolerance mechanical finishing and the Techline laboratory.

Photographs show dies, tools, molds and other precision parts that can be rapidly finished in wet-blast equipment. Also shown are metals and alloys which can be barrel finished, including steel, stainless steel, aluminum, silver, brass, bronze, magnesium, zinc and non-metallic substances.

For further information write Techline Division of Wheelabrator Corporation, 1155 Avenue V, Vicksburg, Mich.

Dow Forms Overseas Subsidiary

The Dow Chemical Company has formed an overseas subsidiary company in Venezuela to handle its international operations.

The wholly-owned subsidiary, Dow Chemical International Limited, S.A., will consolidate overseas sales of Dow products and administer the company's business interests and investments abroad.

An open house recently held by The O'Brien Corporation, South Bend, included display of varied products currently being decorated with O'Brien industrial finishes. Company's many different finishes are used in products ranging from automobiles to floral wreaths.

PROTECT LUNGS against
PAINT SPRAY – DUST – FUMES

DUPOR No. 4 RESPIRATOR has big double filters for easy breathing and greatest filtration! Soft rubber face mask gives airtight fit. Patented DUPOR valves bring in clean air—throw off breathed air! Weight 4 oz. Economical! Costs only $2.00 postpaid. Order Now!

H. S. COVER, Dept. 1207, South Bend 14, Ind.

For more data circle 386 on Postpaid Card

Vacuum Coating Equipment Featured at Plastics Show by NRC Equipment

Use of new techniques in vacuum metallizing of plastic products highlighted the NRC Equipment Corporation exhibit in Chicago's International Amphitheatre during the National Plastics Exposition, held Nov. 17-21.

The display featured an intermediate-capacity, high-speed vacuum coater. Mounted on the four-station planetary jig of the coater were dozens of representative vacuum metallized plastic products.

A mechanically-refrigerated cold trap for use with vacuum coaters was also displayed. It has a refrigeration unit that is capable of maintaining one or two traps at minus 150 deg. F. This makes possible use of the traps in coaters at pressures below 1 x 10^{-4} mm. Hg, and assures continued efficiency of traps used in coaters operating at more ordinary pressures.

The cold trap makes the vacuum coater virtually independent of moisture in the air by condensing it out of the system. Decreased load on the vacuum pump ensures uniform production rates and substantial reduction in rejects caused by water vapor.

Oakite Features Surface Treatments at Metal Exposition

The Oakite CrysCoat Process of phosphatizing and Oakite ChromiCoat for aluminum conversion coating were demonstrated in Booth No. 1230 at the National Metal Exposition by Oakite Products, Inc.

The company also demonstrated paint stripping, drawing and burnishing compounds, and displayed rust preventive treatments and metal cleaning materials.

M. F. Maher, manager of Oakite's metal industries division, was in charge of the booth. He was assisted by F. H. Bruening, Cleveland division manager, and by technical service representatives W. R. Peate, K. J. Cave, M. R. Stevens, H. Wilder, W. L. Russell, G. Reuter, C. L. Blasingame, L. E. Welch, R. B. Potter, H. W. Dieter, J. E. Sauve, R. J. Crane, and D. W. O'Leary.

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Kushner Electroplating School Celebrates Tenth Anniversary

The Joseph B. Kushner Electroplating School of 2509 Washington Avenue, Evansville 14, Indiana, is celebrating its tenth anniversary as a correspondence school in metal finishing and electroplating.

Dr. Kushner requests that alumni who took the course in 1948 and 1949 contact him, as he is preparing an alumni booklet, pictures and write-ups on those who took the course in the early days of the school.

Mahon Designs, Builds Large Flow Coater for Painting Steel Joists

A conveyorized flow-coat painting system capable of handling 24-inch-wide steel bar joists up to 65 feet long has been designed and is being built by R. C. Mahon Co,. Detroit manufacturer of complete finishing systems.

The new system will be an integral part of a major steel producer's fabricating equipment for making joists from roll-formed sections.

The new system includes facilities for upending the joists and for transporting them through drip and drying sections.

Pittsburgh Plate Introduces Aerosol-Packaged Paints

A full line of interior and exterior enamels packaged in 16-ounce spray cans has been added to the Pittsburgh Waterspar line of enamels.

Nine of the colors in the 14-color line are free from lead pigments and

Line of aerosol-packaged paints recently introduced by Pittsburgh Plate Glass Co. includes nine colors free of all lead pigments.

may be safely used on baby furniture and children's toys.

The new product provides a durable gloss finish for all types of interior and exterior surface, dries to touch in minutes and to a hard finish overnight.

Write for new 1958 Catalog of Paint Testing Instruments and Equipment.

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Apex Alkali Adopts New Drum

As part of its 25th anniversary celebration, Apex Alkali Products, Philadelphia manufacturer of cleaning compounds and lubricants, has adopted a new drum for shipping its products.

The new container is lined to protect the contents from contamination, and is lithographed with the company's trade mark.

New House Organ Features Techniques and Applications of "Silent Sound"

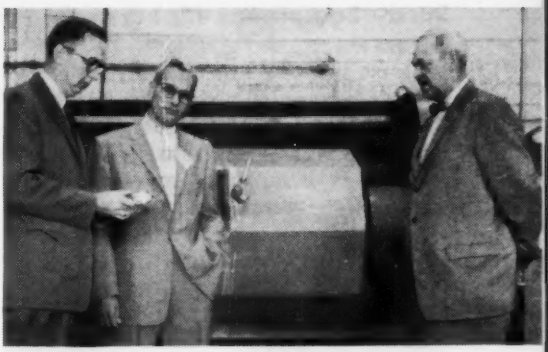
Branson Ultrasonic News, a new house organ devoted to industrial techniques and applications of inaudible sound, is available from Branson Ultrasonic Corporation, Stamford, Connecticut.

Branson is issuing the "News" to exchange information on the latest developments in the field. Questions concerning ultrasonic equipment are invited and technical assistance is offered.

Branson Ultrasonic News may be obtained free by writing Dept. PF, Branson Ultrasonic Corp., 40 Brown House Rd., Stamford, Conn.

Cleveland Demonstrator Demonstrates Vibraslide Barrel Finisher

Stanley Supply Co., Cleveland distributor of polishing, buffing and barrel finishing supplies, recently held an open house to demonstrate the Vibraslide machine.



Boyd Elliott of B. W. Elliott Mfg. Co., Stanley Busch of Stanley Supply Co. and George Gadbois of Honite Div., Minnesota Mining & Mfg. Co., stand before Vibraslide machine during open-house demonstration held in Cleveland.

The Vibraslide is a barrel finishing machine that vibrates the barrel while it is rotating. This type of motion is said to improve results and reduce time required in certain types of barrel finishing operations.

Almco Announces Quantity-Discount Program

A blanket-order program which enables customers to enjoy "sizeable discounts" in quantity purchases of barrel finishing compounds and medias has been announced by Almco, Queen Products Div., King Seeley Corp., Albert Lea, Minn.

As outlined in a new price list, recently published by the company, customers can benefit by anticipating total requirements for any given period of time and then placing a blanket order for all compounds and media to be delivered during that period.

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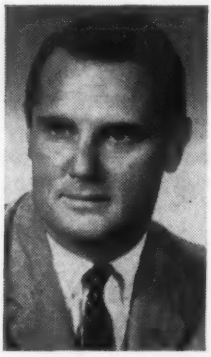
Spray Equipment Makers Enter Pact

Two spray painting equipment manufacturers, Sharpe Manufacturing Co., Los Angeles, and Campell-Hausfeld Co., Harrison, Ohio, have entered into a reciprocal manufacturing, distribution, and sales program in



Kenneth Sharpe

Robert G. Kluener

which each firm will market the other's equipment. The line will include popular-priced and expensive equipment.

Sharpe will handle distribution and sales in western states plus Kansas, Arkansas, Oklahoma and Texas. Campell-Hausfeld will handle the rest of the United States.

Joint announcement of the agreement was made by Kenneth Sharpe, executive vice president of Sharpe Manufacturing Co., and Robert G. Kluener, president of Campbell-Hausfeld Company.

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Stevens Appoints Chemray Distributor

Frederic B. Stevens, Inc., Detroit manufacturer of plating and polishing equipment and supplies, has appointed Chemray Corporation as distributor for the State of Illinois.

Chemray is a newly founded organization, headed by Ray Ledford, who was formerly associated with Industrial Filter & Pump Mfg. Co. as sales manager.

Technic Makes Fast Delivery

Meeting a customer's critical need for 24K gold, Technic, Inc. of Providence, Rhode Island, recently cut delivery time from five days to two hours.

Technic, Inc., loads chartered plane with 100 oz. of 24K Industrial Gold for emergency delivery to a New York defense plant.

The emergency arose when a defense plant in upstate New York ran out of material and informed Technic, Inc. at noon that 100 ounces of Technic Industrial 24K Gold were required immediately. The order, packed and shipped at 1:00 P.M. by chartered plane, was delivered to a dirt landing field within one mile of the customer's plant at 3:00 P.M.

Normal routing of the material would have involved five days from time of shipment.

H-VW-M Installs Test Line for Continuous Strip Anodizing

A new test line for solution of problems in continuous high-speed strip anodizing, sealing and dyeing processes has been set up in Matawan, N. J., by Hanson-Van Winkle-Munning Company.

It is designed for study of problems in electroplating, etching, cleaning, pickling and other industrial process requirements for high-speed continuous treatments.

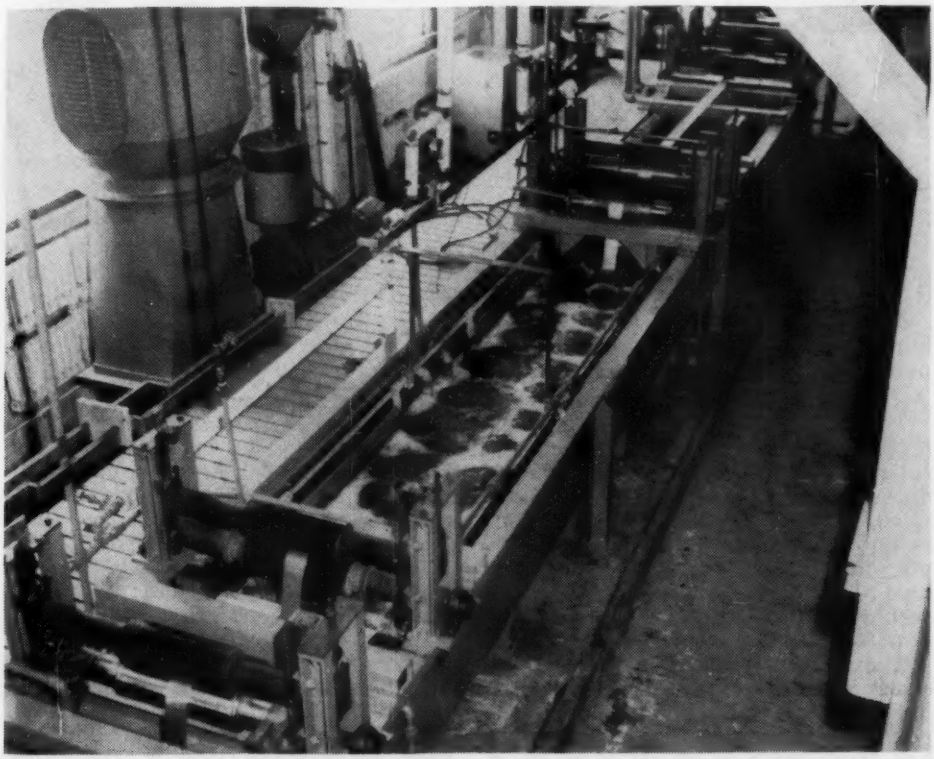
Completely automatic, the line may be arranged and equipped so as to duplicate exactly the conditions prevailing in a given plant operation. Control of these conditions is essential if reliable results are to be obtained from laboratory tests of solutions, deposit characteristics and corrosion resistance.

The line, which is available to the firm's customers in the aluminum and steel industries, will also be used in research on strip anodizing and plating techniques.

NEW POSITIONS

Edward A. Perry has joined **American Smelting and Refining Company** as a technical representative in the Plating and Electroplating Department of the company's Federated Metals Division.

Mr. Perry has spent the past six



Hanson-Van Winkle-Munning's Newly Installed Test Line for Continuous-Strip Anodizing

years in the Electroplating Department of the McGean Chemical Company in Cleveland.

★ ★ ★

Gerald F. Delaney has joined the "Platecoil" Division of Tranter Manufacturing, Inc., Lansing, Mich. manufacturer of heat transfer units, truck refrigeration equipment and radiant heating panels. He will concentrate on application engineering.

K. J. Carson

G. F. Delaney

Kenneth J. Carson has been named vice-president and Atlantic district manager of **Interchemical Corporation's** Finishes Division.

Mr. Carson will have full responsibility for administration, sales and production on the Eastern Seaboard.

★ ★ ★

Golden Latshaw, formerly president of **Hydromatic Metal Finishing Corp.,** of Cleveland, Ohio, and a finishing consultant in southern California, has joined **C. O. Fiedler, Inc.,** Los Angeles, California, as sales and technical director of the company's new Surface Systems Division.

The new division was created recently to manufacture and sell barrel finishing equipment, media and compounds. The Surface Systems Division has developed new blends of media in preformed shapes.

The George L. Nankervis Company, Detroit manufacturer and distributor of metal finishing supplies and equipment has announced the appointment of **Ward J. Beauchamp,** treasurer, and **Kenneth J. Battjes,** secretary.

Mr. Beauchamp has been with Peninsular Metal Products Corporation, parent company of Nankervis, for fifteen years as secretary-treasurer and continues to maintain this office in addition to his new position with Nankervis.

K. J. Battjes

W. J. Beauchamp

Mr. Battjes has been with Nankervis since 1950 and is manager of public and employee relations for the company.

★ ★ ★

Albert P. Gagnebin has been elected vice-president and **Joseph M. Weldon** assistant vice-president of **The International Nickel Company, Inc.**

Mr. Gagnebin was elected an assistant vice-president in December, 1957. He became manager of the Nickel Sales Department in April, 1956, after serving as assistant manager beginning in January, 1955.

Mr. Weldon has been assistant to the vice-president of The International Nickel Company, Inc. since December, 1953. He first became associated with the company in 1927 and has held various positions in the sales, executive and other departments.

A. E. S. GOLDEN JUBILEE CONVENTION,
5th Industrial Finishing Exposition
Detroit, Michigan, June 14-19

T. S. Dewoody, Jr. has been appointed manager of the Technical Staff for the **Electro Chemicals Div. of Diamond Alkali Co.**, Cleveland, Ohio.

★ ★ ★

Chicago Vitreous Corporation, A Division of the Eagle-Picher Company, Cicero, Illinois has announced the retirement of **W. Hogenson,** president, and **E. Hogenson,** executive vice-president. **A. S. Ault,** formerly vice-president and general manager, has been named president.

Mr. Ault joined Chicago Vitreous in 1936, has served in a number of capacities in his rise to leadership of the company.

N.A.M.F. Announces 1959 Convention Committee

Glenn H. Friedt, Jr., vice president of United Platers, Inc., Detroit, has been named general chairman of the 1959 convention committee of the National Association of Metal Finishers, according to an announcement by N.A.M.F. president George W. Taylor.

Serving with Mr. Friedt are Webster B. Knight, Sr., president of Knight Plating Co., Detroit, who is the convention co-chairman, and Edward N. Marlette, president of Marlette Plating Co., Buffalo, educational chairman.

The 1959 NAMF conclave will be held in Detroit from June 14 to 16,

Ladies Auxiliary of Detroit Branch American Electroplaters' Society holds planning session to arrange ladies' activities for Golden Jubilee Convention of the A.E.S. Mrs. George Pillsbury is chairman of the Ladies' Committee. (Photograph by PRODUCTS FINISHING)

with headquarters at the Hotel Statler. A general meeting of the membership, elections, committee meetings, a two-day management seminar, and the traditional banquet will highlight the three-day convention of job shop owners and operators.

Grand Rapids Branch A.E.S. Announces Annual Educational Session

General Chairman Donald Smith has revealed plans for the Grand Rapids Branch Annual Educational Session and Banquet, to be held on January 17, 1959.

Educational Chairman Orville Hoxie has arranged an educational program consisting of discussion of "Hi-Speed Copper Plating" by Barnet Ostrow of Lea-Ronal, Inc., Waterbury, Conn., beginning at 10:30 A.M.

Luncheon will be served at noon and followed by a talk entitled, "Scientific Aids in Crime Detection" by Officer Karl Kempe of the Grand Rapids Police Crime Laboratory.

The banquet will be held in the Pantlind Hotel Ballroom at 7:00 P.M. Reservations will be accepted by John Dykstra after December 1. Other members of the Committee include: Robert Blackford, entertainment; Thomas Henner, publicity; Edwin Krook, programs; and William Griffin, favors.

Southeastern Branch A.E.S. to Host Dixie Regional Meeting, Sixth Interim Meeting

The First Dixie Regional Technical Educational Session will be held concurrently with the Sixth Interim Meeting of the A.E.S. on February 13-14 at the Dinkler-Plaza Hotel in Atlanta, Georgia. The Southeastern

Host-branch committee for the First Dixie Regional Technical Educational Session. Seated (left to right), Bob M. Taylor, Southeastern Branch first vice president; Claude J. Nalley, president; Myron M. Randman, committee general chairman; Herschel R. Stogner, Sr., secretary-treasurer. Standing, John E. Varner, program chairman; Mrs. Myron M. Randman, ladies program; George W. Taylor, board of managers; Mrs. Charles I. Lewis, ladies program; William F. Kelly, publicity chairman; Mrs. William F. Kelly, ladies program; Charles I. Lewis, plant-visitation chairman; Clyde Stovall, board of managers; Fred Fulforth, Sixth Interim Meeting coordinator. Committee members not present, Justus U. Bellville, entertainment chairman; Richard R. Russell, registration chairman and Jerita D. Wilson, educational chairman for the February 13 regional meeting.

Branch of the A.E.S. will be host for the meeting.

The two-day meeting will include a plant tour, two educational sessions and the Annual Interim Meeting of the Society. A reception and banquet on Saturday evening, February 14, will conclude the meeting.

TRAINING COURSES

Course in Electroplating

The course of study in electroplating given at the Fort Greene Evening High School, 29 Fort Greene Place, Brooklyn, N. Y. (formerly Brooklyn Evening Technical High School) will begin its Spring term on February 2, 1959.

The session is divided into classroom discussion and laboratory experiments. The classroom topics will include simple calculations, reading graphs, chemistry of the plating tank, pH, wetting agents, pitting, deionizing. The laboratory experiments will include solution analysis, Hull cell studies, anodizing.

Registration begins January 26, 1959, and will be held daily thereafter from 7:00 to 8:30 p.m. Classes will meet on Tuesday and Thursday from 6:45 to 8:15 p.m. including about six Fridays. The term begins February 2 and ends June 25. Register with L. Serota in Rooms BW17 and 3E2.

MEETINGS of INTEREST to FINISHERS

Dec. 5-6. Annual Educational Session and Banquet, Detroit Branch, A. E. S., Hotel Statler, Detroit, Mich.

Dec. 12-13. Annual Educational Session and Christmas Party, Newark Branch, A. E. S., Hotel Robert Treat, Newark, N. J.

Dec. 20. Annual Christmas Party, Buffalo Branch, A. E. S., Niagara Manor, Buffalo, N. Y.

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Jan. 17, 1959. Annual Educational Session and Banquet, Grand Rapids Branch, A. E. S., Pantlind Hotel, Grand Rapids, Mich.

Jan. 31, 1959. Annual Meeting and Banquet, Chicago Branch, A. E. S., Conrad Hilton Hotel, Chicago, Ill.

Jan. 31, 1959. Annual Educational Session and Dinner Dance, Cleveland Branch, A. E. S., Cleveland, Ohio.

Feb. 7, 1959. Annual Educational Session and Banquet, New York Branch, A. E. S., Hotel Statler Hilton, New York, N. Y.

Feb. 13-14, 1959. Annual Educational Session and Banquet, Dixie Regional Group, A. E. S., Dinkler Plaza Hotel, Atlanta, Ga.

Feb. 14, 1959. A. E. S. Sixth Interim Meeting, Sponsor—Dixie Regional Group, Host-Southeastern Branch, A. E. S., Dinkler Plaza Hotel, Atlanta, Georgia.

June 14-19, 1959. Golden Jubilee Convention and Industrial Finishing Exposition, Fifth International Conference on Electrodeposition, Detroit, Michigan.

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PRODUCT LITERATURE

40. Clear Coating
Information on Agateen No. 13C, a clear finish said to be especially useful in nameplate applications. Agate Lacquer Manufacturing Co., Inc., 11-13 43rd Rd., Long Island City, N. Y.

41. Plating Brighteners
Information on Isobrite plating brighteners for cadmium, copper, zinc, white brass. Allied Research Products, Inc., 4004-06 E. Monument St., Baltimore 5, Maryland.

42. Barrel Finishing Equipment, Supplies
A 48-page catalog of barrel finishing equipment and supplies describes the Supersheen method of barrel finishing, its advantages, typical applications. Includes useful information, specific data on time cycles, compounds, speed of rotation, media, water level, load height. Almco, Queen Products, Inc., 812 Marshall St., Albert Lea, Minn.

43. Guide to Chemical Treatments
An eight-page brochure describes various chemical conversion coatings for steel, aluminum, galvanized iron, zinc and cadmium plated surfaces; for corrosion resistance, paint bonding, drawing and forming, protection of friction surfaces. Includes list of government specifications. Amchem Products, Inc., Ambler 14, Pennsylvania.

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44. Anodes for Acid Copper Plating
Reprint of an article about copper plating anodes describes the benefits that accrue to the user of alloy anodes containing a small amount of phosphorous. American Brass Co., Waterbury 20, Connecticut.

45. Barrel Finishing Machinery
A four-page folder describes and illustrates standard and special barrel finishing machines, barrels, multiple-barrel machines. The Baird Machine Co., Dept. PF, Stratford, Conn.

46. Corrosion-Resistant Coatings
Booklet entitled "What Every Maintenance Man Should Know About Urethane Coatings" describes characteristics of these plastic coatings: resistance to corrosive chemicals and fumes; resistance to abrasion, heat, sunlight, weather. Better Finishes & Coatings, Inc., 268 Doremus Ave., Newark 5, N. J.

47. Ultrasonic Cleaning Equipment
Data on Blakeslee conveyorized and open-tank models of ultrasonic cleaning equipment. G. S. Blakeslee & Co., 1844 S. Laramie Ave., Chicago 50, Ill.

48. Tack Cloth
Literature on treated cloths that pick up dust and lint prior to paint finishing. Bond Chemical Products Co., 2639 N. Clybourn Ave., Chicago 14, Ill.

49. Self-Sticking Felt
Information on Quik-Felt, a self-sticking wool felt that has numerous uses, including prevention of scratches on highly polished surfaces. W. H. Brady Co., 746 W. Glendale Ave., Milwaukee 9, Wisconsin.

50. Masking Aids
"Time-Saving Masking Aids for Better Product Finishing" is the title of an illustrated brochure that describes masking discs, plugs, caps, corks, tape. Includes information on tape dispensers. By-Buk Co., 4314 W. Pico Blvd., Los Angeles 19, Calif.

51. Drying Oven
Information on gas-fired recirculating ovens in many types and sizes. The Carl Mayer Corp., 20800 Center Ridge Rd., Cleveland 16, Ohio.

52. Corrosion-Proof Lining
Technical bulletin on Coroline, a thermosetting lining that can be troweled on to protect chemical storage tanks, pickling and plating tanks, processing tanks, pits and foundations. The Ceilcote Co., Inc., 4848 Ridge Rd., Cleveland 9, Ohio.

53. Overhead Conveyors
Descriptive literature on Chainveyor overhead conveyors lists advantages, tells about "power and free" systems. Chainveyor Corp., 5618 E. Washington Blvd., Los Angeles 22, Calif.

54. Motor Generators
Booklet D-103 describes and illustrates complete line of modern low-voltage generators. Chandeysson Electric Co., 4082 Bingham Ave., St. Louis 16, Mo.

55. Contact Wheel
Data sheet describes advantages of the R-57 rubber contact wheel. Chicago Rubber Co., Inc., 651 Market St., Waukegan, Illinois.

56. Buffs
Data sheet describes Buff Type No. 20-DOTA, a heavy-duty buff made of sisal twine, used for finishing steel, brass, aluminum. Geo. R. Churchill Co., Inc., Dept. PF, Hingham, Mass.

57. Cleaning and Finishing Machinery
A 24-page catalog of metal cleaning and finishing machinery includes sections on principles of metal cleaning, descriptions of various types of cleaning equipment, phosphatizing machines, spray booths, drying ovens. Cincinnati Cleaning & Finishing Mchry. Co., 2008 Hageman St., Cincinnati 41, Ohio.

58. Rhodium Plating Instructions
Handy pocket-sized booklet gives complete instructions for rhodium plating, includes data on solution preparation, work preparation, temperatures and current densities, tanks, anodes, and so on. Sigmund Cohn Mfg. Co., Inc., 121 S. Columbus Ave., Mount Vernon, N. Y.

59. Aluminum Etchant
Technical data sheet on Cowles AK tells how this formulation works on all aluminum alloys, prevents build-up of scale by means of a special sequestering agent. Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, Ohio.

60. Water-White Lacquer
Information on Daconite 5600 clear lacquer, a ready-to-spray lacquer that is said to have excellent paleness and color retention. James B. Day & Co., 1872 Clybourn Ave., Chicago 14, Ill.

61. Panel Heaters
Data Bulletin 258 describes the Thermo-Panel Coil, a heat exchanger that is formed by welding two embossed sheets together to form flow channels. Dean Thermo-Panel Coil Div., Dean Products, Inc., 622 Franklin Ave., Brooklyn 38, New York.

62. Ovens
Bulletin C describes various standard ovens for production heating and drying applications requiring temperatures up to 750 deg. F. Despatch Oven Co., Dept. 53A, 619 S. E. Eighth St., Minneapolis 14, Minnesota.

63. Spray Gun Catalog
New catalog (Form I-2000) covers manual and automatic spray guns for general and special service. Tells the user how to select the proper gun for the job to be done and the material to be used. Includes valuable information on cleaning and lubricating spray guns. Dept. 133, The DeVilbiss Co., Toledo 1, Ohio.

64. Vapor Degreasing
"Vapor Degreasing with Diamond Perchlorethylene" is the title of a 12-page technical bulletin that presents data on 13 major advantages of vapor degreasing prior to painting, plating and other finishing operations. Includes sections on essentials of vapor degreasing equipment, methods of scheduling vapor-degreaser cleanouts and solvent distillation, suggested operating procedures. Diamond Alkali Co., Chlorinated Products Div., 300 Union Commerce Bldg., Cleveland 14, Ohio.

65. Sintered Tumbling Shapes
Bulletin describes a new type of sintered metal tumbling media that is produced by a special sintering process. Technical data included is based on field tests of the media. Dixon Sintaloy, Inc., 537 Hope St., Stamford, Conn.

66. Cold Cleaning Solvents
Literature on Chlorothene solvent, formulated to be used in cold cleaning operations. Chemicals Sales Dept. 763G, The Dow Chemical Co., Midland, Mich.

67. Water Wash Spray Booth Compound
Information on Diff. LX Klarifiant, a spray booth compound that is said to prevent clogged nozzles, booth rusting, foam, and curtain "build-up." DuBois Co., Inc., 1120 W. Front St., Cincinnati 3, Ohio.

68. Ready-Mixed Gold
Information on Sea-Lac ready-mixed gold finishes for application by spray or dip. Duralac Chemical Corp., 84 Lister Ave., Newark, N. J.

69. Immersion Gold Plating Solution
Information on Atomex immersion gold plating solution, which will deposit a thin coating of gold on a wide variety of parts by simple immersion. Engelhard Industries, Inc., Chemical Div., 113 Astor St., Newark, N. J.

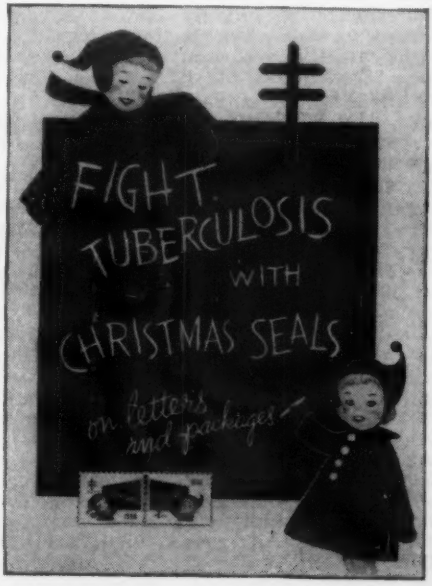
70. Die-Casting Alloys
Di-Metal die-casting alloys, their properties and industrial applications are described in a 32-page booklet that includes sections on metallurgy of these alloys, their applications and techniques for handling during melting and casting. Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.

71. Q-Panels
Data sheet on standard test panels for use in the laboratory in checking finishes. Gardner Laboratory, Inc., P. O. Box 5728, Bethesda 14, Md.

72. Immersion Heaters
Bulletin describes and gives specifications for acid- and alkali-resistant quartz immersion heaters. Glo-Quartz Electric Heater Co., Inc., Willoughby, Ohio.

73. Bright Copper
Data sheet describes Cynorex high-speed copper cyanide plating process and Cuprex acid copper plating process, tells about advantages of each. Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

74. Electrostatic Spray Equipment
Catalog illustrates numerous electrostatic spray systems developed to help manufacturers eliminate bottlenecks in their finishing departments. Ionic Electrostatic Corp., 111 Monroe St., Garfield, N. J.



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75. Barrel Nickel Brightener
Technical information on Jelco barrel nickel brightener. Jelco Finishing Equipment Corp., 153 E. 26th St., New York 10, New York.

76. Ovens for Industry
"Ovens for Industry" catalog describes and illustrates many different types and sizes of industrial ovens. Kirk & Blum Mfg. Co., 3116 Forrer St., Cincinnati 9, Ohio.

77. Pressure Curtain Coater
Data File SIF-7 contains complete data on the Steinemann-Koch pressure curtain coater, which applies a uniform coating of lacquer or synthetic material on flat or moderately curved work. Patented Swiss process in which a vertical film is poured onto the work from adjustable orifices as the work passes through the machine. George Koch Sons, Inc., Evansville 4, Indiana.

78. Plating Course
Information on a correspondence course in electroplating. Joseph B. Kushner Electroplating School, 2509 Washington Ave., Evansville 14, Indiana.

79. Baking and Drying Equipment
Catalog No. 560 describes and illustrates various types of baking and drying equipment. The Lanly Co., 2800 Euclid Ave., Cleveland 15, Ohio.

80. Multiple-Process-Cycle Plating Machine
Information on the Select-O-Matic automatic plating machine, which allows the operator to select any one of several plating cycles when he loads the machine, merely by turning a dial. Lasalco, Inc., 2820 LaSalle St., St. Louis 4, Mo.

81. Red Primer
Information on the advantageous features of Napry Red Primer. Lowe Brothers Co., Dayton 2, Ohio.

82. Finishing Systems
Catalog No. A-658 discusses the advantages of complete, conveyorized finishing systems. Includes data on cleaning and pickling equipment, ovens, spray booths, air-supply systems, complete systems for painting, porcelain enameling, flow and dip coating. The R. C. Mahon Co., Detroit 34, Mich.

83. Plastisol Compounds
Bulletin VP-2 describes series 4000 and 5300 plastisol compounds—vinyl materials available in various types for a wide variety of applications and functions, from anti-corrosive protective coatings to abrasion-resistant decorative finishes. Tells how to apply, discusses properties obtained, advantages of use. Metal & Thermit Corp., Rahway, N. J.

84. Drum Upender
Information on a handy tool for upending heavy drums easily. Morse Mfg. Co., Inc., 762 W. Manlius St., E. Syracuse, New York.

85. Vacuum Thermocouple Gage and Control
Two pages on the NRC Model 521 Vacuum Thermocouple Gage and the two-station Model 721 Thermocouple Gage Control. Gage and control provide direct and continuous indication of total pressure from 2500 to one micron absolute at either of two points. NRC Equipment Corp., Dept. 23-Z, Charlemont St., Newton 61, Massachusetts.

86. Clear Protection
Information on 2105 Clear Lacquer for the protection of brass, silver, bronze and copper. G. J. Nikolas & Co., Inc., 2880 Washington Blvd., Bellwood, Ill.

87. Airless Spray Painting
A six-page brochure tells about the airless spray painting method, answers typical questions about the process. Applications and advantages are listed. Nordson Corp., Amherst, Ohio.

88. Immersion Heater
Descriptive literature on Therm-X immersion heaters, available in quartz and stainless steel with built-in temperature control. N. J. Thermex Co., Inc., 535-533 Bergen St., Harrison, N. J.

89. Barrel Finishing Abrasives
An 85-page manual on barrel processing contains valuable data on the barrel finishing process, typical parts and materials, types of abrasives, equipment, compounds, rust preventives, and a glossary of terms. Norton Co., Worcester 6, Mass.

90. Heavy Phosphate Coating
Folder describes Oakite Cryscoat HC, which produces a heavy (150 to 1200 milligrams per square foot) phosphate coating. Oakite Products, Inc., 20 Rector St., New York 6, N. Y.

91. Automatic Polishing
Information on automatic polishing and buffing machines. Packer Machine Co., Meriden, Conn.

92. Phosphate Coating for Aluminum
Folder describes Bonderite 700 Series for aluminum. Available in two colors—gold and green, both of which increase corrosion resistance. Parker Rust Proof Co., 2172 E. Milwaukee Ave., Detroit 11.

93. Repair Your Own Plating Tanks
Information on equipment and materials for patching, seaming and leak testing of plating tanks. Perma-Line Rubber Products Co., 1753 N. Winnebago Ave., Chicago 48, Ill.

94. Self-Spray Paints
Details on company's service of packaging touch-up paints in aerosol-spray cans, under any label desired. Plasti-Kote, Inc., 9801 Harvard Ave., Cleveland 5, Ohio.

95. Electrostatic Spray Painting
Information on the Ransburg No. 2 electrostatic spray painting process. Ransburg Electro-Coating Corp., P. O. Box 7822, Indianapolis 23, Ind.

96. Pearlescent Finishes
Information on air-dry and baking-type pearlescent finishes. Rona Laboratories, Inc., East 21st and East 22nd Sts., Bayonne 4, N. J.

97. Barrel Finishing Catalog
A 24-page catalog on barrel finishing sets forth a clear explanation of mechanical finishing processes, tells how barrel finishing can be used in grinding, deburring, descaling, polishing and coloring of metal parts. Includes data on Roto-Finish barrel finishing machines, chip bins, separators, dryers, screens and so on. Roto-Finish Co., 3704 Milham Rd., Kalamazoo, Mich.

98. Temperature Controls
Sarco Case History No. 174 describes and illustrates typical applications where Sarco Electric Indicating Temperature Controls have improved liquid processing operations. Sarco Co., Inc., 635 Madison Ave., New York 22, N. Y.

99. Finishing Systems
Literature on Schmieg finishing equipment — spray booths, washers, ovens, other equipment used in painting. Schmieg Industries, Inc., P. O. Box 4701, Detroit 34, Mich.

100. Rhodium Plate
A 24-page booklet tells where, when and how to use rhodium electroplates for electrical, electronic and other exacting industrial applications. Booklet gives detailed analysis of advantages of rhodium plate in specific applications. Includes graphs and charts that show rates of deposition under various conditions; bath preparation and control; current densities; and so on. Sel-Rex Corporation, Nutley 10, N. J.

101. Filter Pumps
Folder describes Sethco filter pump units, includes data on various models, types of filter tubes, rate of filtration, back washing, operational advantages. Sethco Mfg. Co., 2292 Babylon Turnpike, Merrick, Long Island, N. Y.

102. High-Temperature Masking
Information on Shurtape, especially designed for use in masking articles that are subject to extreme heat in baking. Shuford Mills, Inc., Hickory, N. C.

103. Laboratory Services
Folder entitled "When, Why, How to Use an Independent Laboratory." South Florida Test Service, 4301 N. W. Seventh St., Miami 44, Florida.

104. Technical Data on Hot Spray
Revised edition of the booklet "Why Hot Spray?" includes technical information on the advantages and possibilities of hot spray painting process. Spee-Flo Co., Houston 11, Texas.

105. Spray Nozzle Catalog
Catalog No. 24 is a 48-page booklet containing complete data on various spray nozzles and accessories. Nozzles are listed in tabular form and complete information is given on pipe sizes, external dimensions, orifice diameters, capacities and spray angles. Spraying Systems Co., 3229 Randolph St., Bellwood, Ill.

106. Strippable Coatings
Bulletin tells how metals and painted parts can be protected during assembly and transit by a plastic coating that is sprayed on, stripped off when product is ready for use. Spraylat Corp., One Park Ave., New York 1, N. Y.

107. Automatic Metal Finishing
Information on "Little Steve," a compact automatic processing machine that can be adapted to anodizing, dip-painting, flow coating, bright dipping, ultrasonic cleaning, electropolishing, tin immersion processing, other finishing processes. Frederic B. Stevens, Inc., 1800 Eighteenth St., Detroit 16, Michigan.

108. Materials Handling Equipment
Form 35-12 describes and illustrates a complete line of equipment and accessories for pumping semi solids and fluids from storage or container to point of application. Includes data on pumps, agitators, pressure regulators, hoses, air consumption rates. Alemite Div., Stewart-Warner Corp., Dept. AF-108, 1850 Diversey Parkway, Chicago 14, Ill.

109. Air Sanders
Data on portable air-operated sanding machines. Sundstrand Magnetic-Pneumatic Products, Div. of Sundstrand Machine Tool Co., Rockford, Ill.

110. Vacuum Metallizing Coils
Specification booklet entitled "Tungsten Coils for Vacuum Metallizing" contains information on standard vacuum metallizing coils, lists each coil according to dimensions and type of material. Sylvania Electric Products, Inc., Chemical and Metallurgical Div., Towanda, Pa.

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111. Soluble Precious Metals for Electroplating
Folder lists gold, rhodium, palladium, platinum, silver, and alloy precious metal plating solutions available from stock. Technic, Inc., Providence 1, R. I.

112. Etch Primer
Data on Gripalloy, an etch primer available in black and colors. Used as primer or finish coat. Tenax, Newark 5, N. J.

113. Zinc Plating Solution Purifier
Folder on Zinc-Brite, a cleansing and purifying agent for cyanide zinc plating solutions. Sulphur Products Co., Inc., 621 W. Pittsburgh St., Greensburg, Pa.

114. Cob Grits for Blasting, Tumbling
Information on corn cob grits that are used as tumbling media and in blast cleaning. Ti-Co Industries, Inc., P. O. Box 185, Tipton, Indiana.

115. Abrasive Belt Sander
Data sheet describes Speedbelt 12 high-speed abrasive belt polishing machine. Timesaver Sanders, P. O. Box 7446, Robbinsdale Station, Minneapolis 22, Minn.

116. Brass Plating Solution
Technical bulletin on True Brite brass solution, which is available in a variety of colors. True Brite Chemical Products Co., Box 31, Oakville, Conn.

117. Barrel Bright Zinc Plating
Bulletin No. Z-1-ZB describes Udylite Bright Zinc Process ZB, tells about what basis metals may be plated, cleaning procedures, equipment requirements, sludge, rinsing, drying, preparation of solution, operating conditions, additions. Udylite Corp., Detroit 11, Michigan.

118. Acrylic Coatings
Performance and application information on acrylic-based coatings. The Varnish Products Co., 5204 Harvard Ave., Cleveland, Ohio.

119. Goggles
Data on fog-proof goggles that protect eyes against paint spray, dust, fumes. H. S. Cover, Dept. 1007, South Bend 14, Indiana.

120. Roller Coater
Data sheet describes new heavy-duty Walco coater, a roller coating machine useful for applying paints, drawing compounds, adhesives and other coatings on flat sheets. L. R. Wallace & Co., 172 North Vernon Ave., Pasadena, Calif.

121. Rack Trucks
Information on rack trucks designed for batch-type baking operations. Wilder Mfg. Co., Inc., Dept. H, Mechanic St. & Erie RR., Port Jervis, N. Y.

122. Cleaning Procedures for Aluminum
"Work Wonders with Aluminum" is the title of a folder that describes etching, desmutting, paint stripping, barrel finishing, and deoxidizing procedures. Industrial Department, J. B. Ford Div., Wyandotte Chemicals Corp., Wyandotte, Michigan.

123. Baking and Drying Ovens
Bulletin 157 describes line of batch and conveyor-type baking ovens for heating up to 1,000 deg. F. Young Brothers Co., 1830 Columbus Rd., Cleveland 13, Ohio.

124. Centrifugal Pumps
Bulletin P-6-258. Four pages of data on Series E elastomer-lined centrifugal pumps, useful in pumping corrosive solutions. Ampco Metal, Inc., Milwaukee 46, Wisconsin.

125. Ventilating Bias Buffs
Data sheet describes Kul Kut ventilated bias buffs. Chas. F. L'Hommedieu & Sons Co., 4521 Ogden Ave., Chicago, Ill.

126. Spray Painting Equipment
A 20-page catalog of portable air compressors and paint-spraying equipment. Campbell-Hausfeld Co., Harrison, Ohio.

127. Automatic Polishing, Buffing Machinery
Data sheet on company's line of polishing and buffing equipment shows various types of automatic equipment. Arthur H. Losey Co., 110 S. Horton St., Jackson, Mich.

128. Plating and Processing Machine
Bulletin U-658, four pages. Illustrates single-line plating and processing machine, with emphasis on features of the carriers, frame and drive. Meaker Company, 1629 S. 55th Ave., Chicago 50, Ill.

129. Infrared Oven Sections
Infrared oven sections that can be assembled to make batch-type ovens, mounted in contoured combinations for continuous conveyor-line applications, or purchased as complete portable ovens are described in Form 4999. Lighting Div., Safety Industries, Inc., P. O. Box 70, Milford, Conn.

130. Copper Anodes
Information on "Phosphor-Brite" rolled copper anodes for acid copper plating baths. Univertical Foundry and Machine Co., 14841 Meyers Rd., Detroit 27, Mich.

131. Ten Methods of Ion Exchange
Technical reprint T-159 tells how each of ten methods works, what controls and equipment are required. Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.

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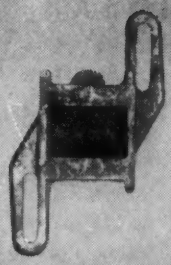

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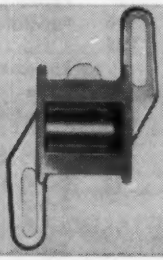

WITH THIS

Two Reasons WHY BLACOSOLV® IS BEST!

1. BLACOSOLV trichlorethylene contains a mixture of entirely new and different stabilizers that prevent solvent breakdown and possible acid formation. Will not affect or stain any metal. Easily distilled. Assures better production and higher stability.

2. As a user of BLACOSOLV trichlorethylene you can expect periodic visits from your representative. Both he and your BLACOSOLV distributor have a wealth of experience in this field, and willingly offer their assistance whenever you need it. Their technical backgrounds will help you solve any metal parts cleaning problem you might have.

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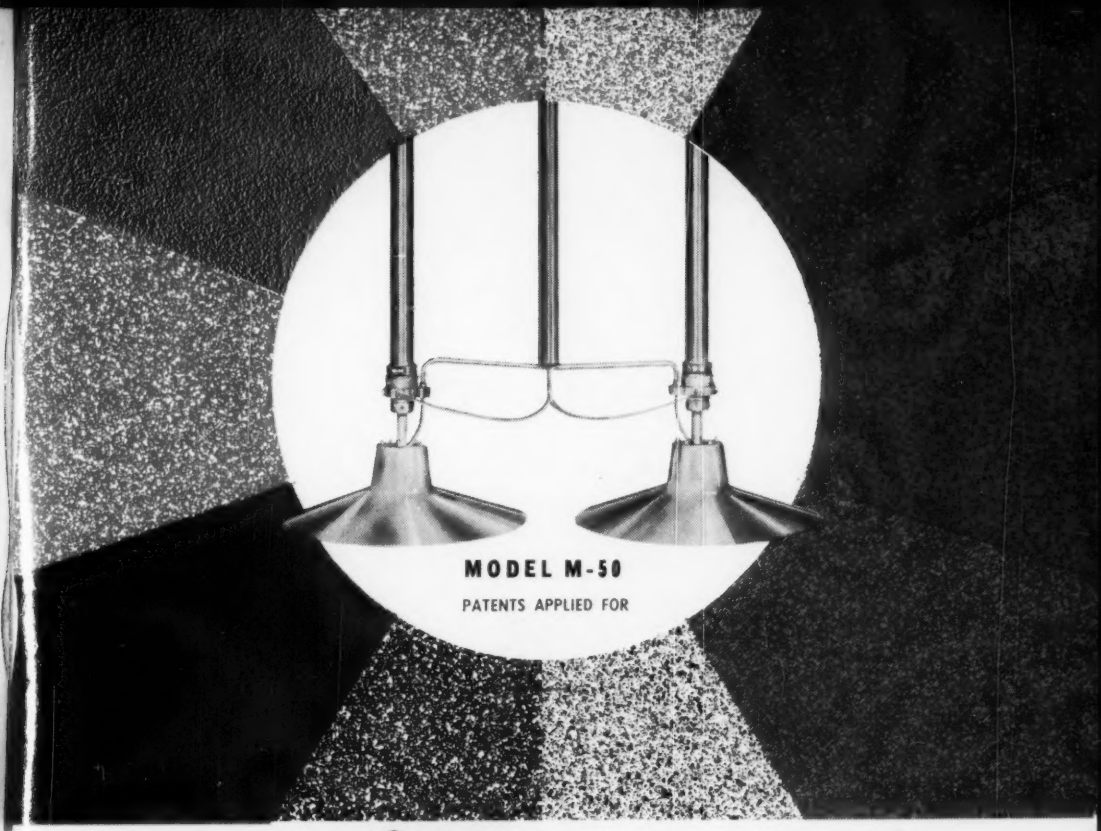

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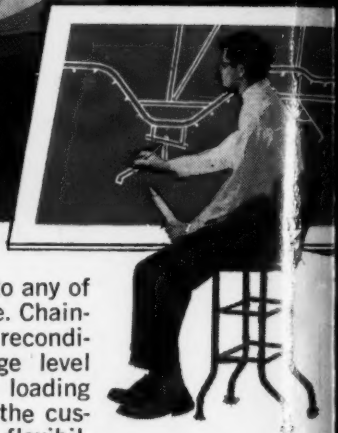
AUTOMATIC OVERHEAD LOADING AND UNLOADING



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